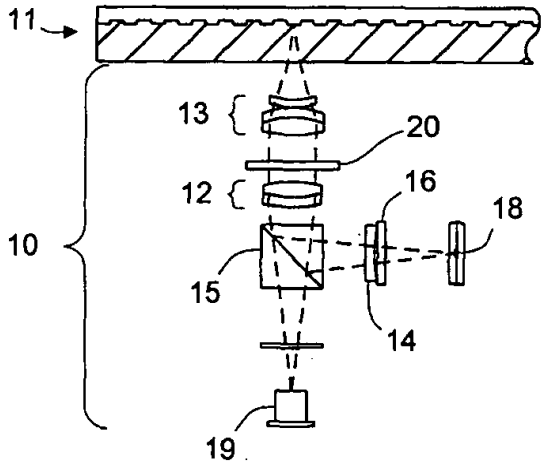


FIG. 1A

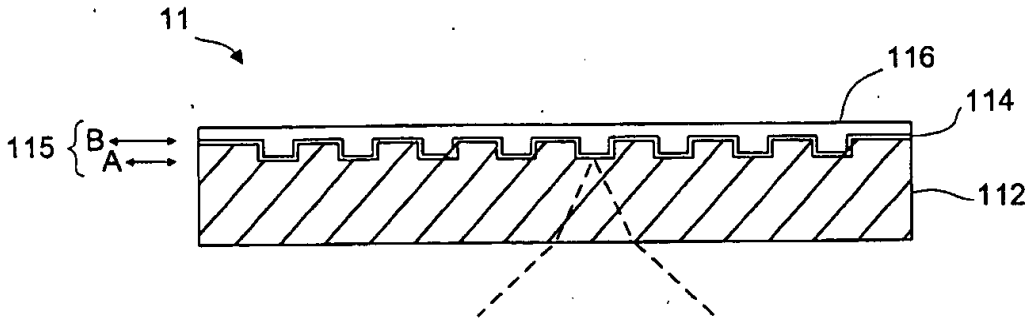


FIG. 1B

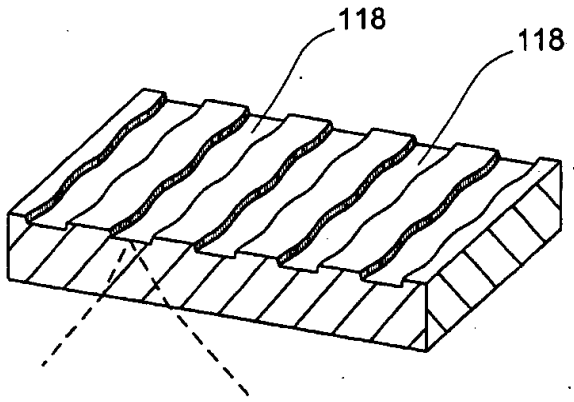


FIG. 1C

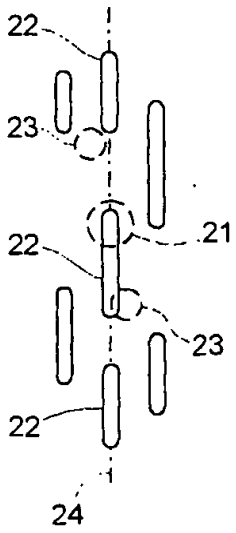


FIG. 2A

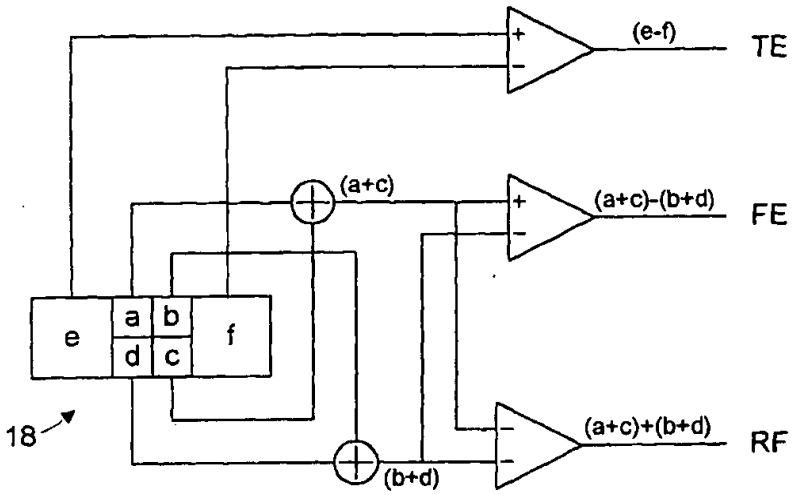


FIG. 2B

FIG. 3A

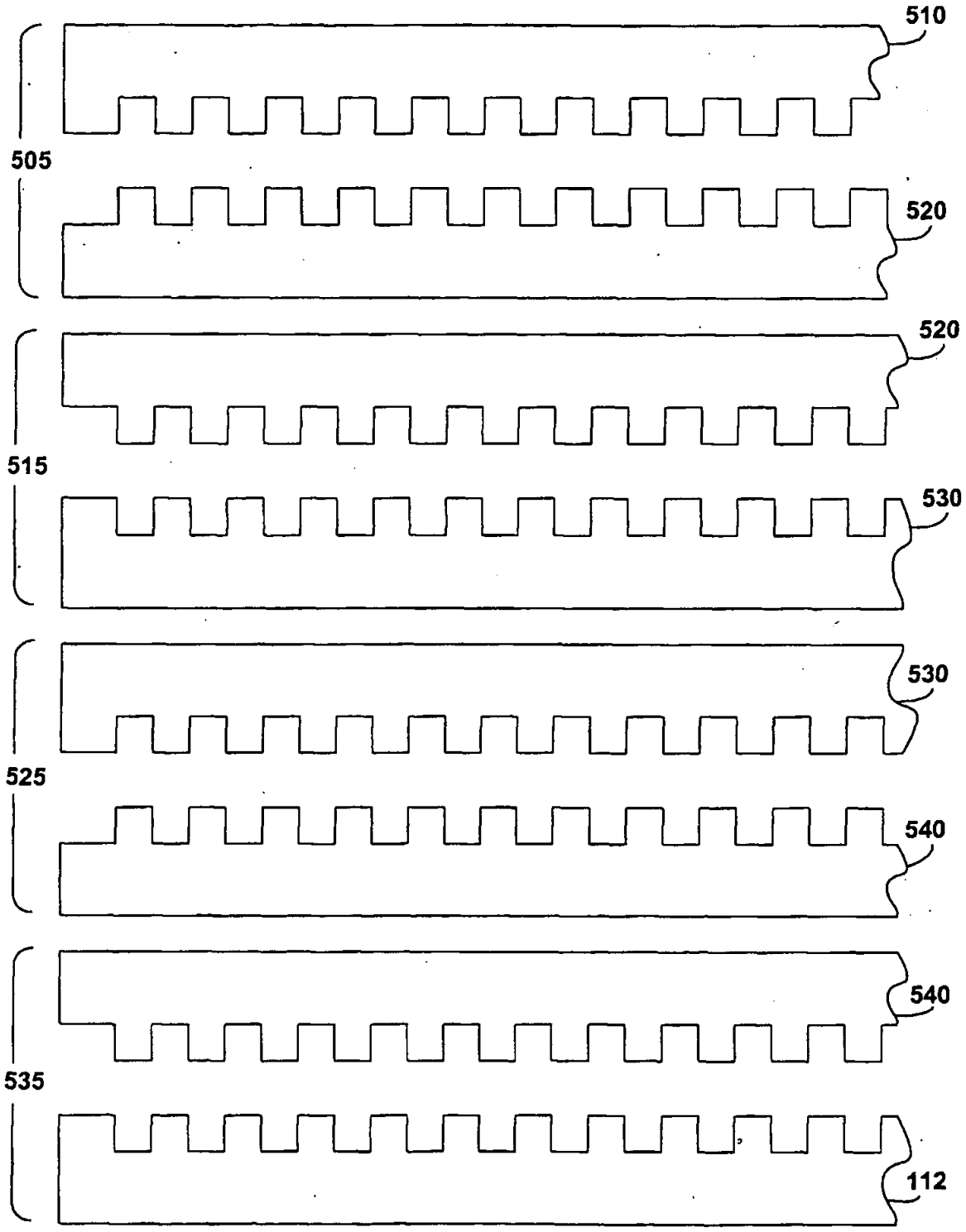


FIG. 3B

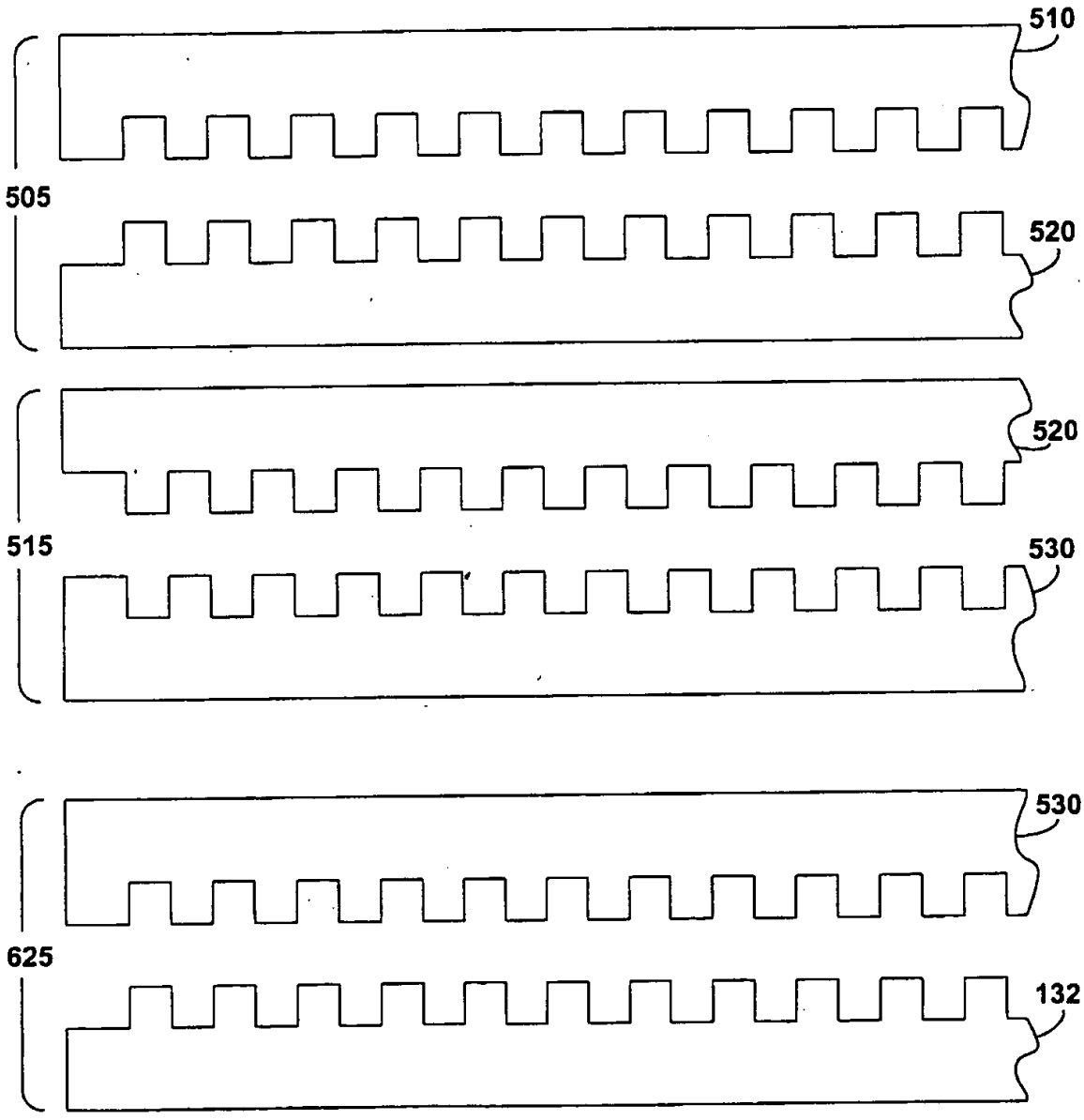


FIG. 3C

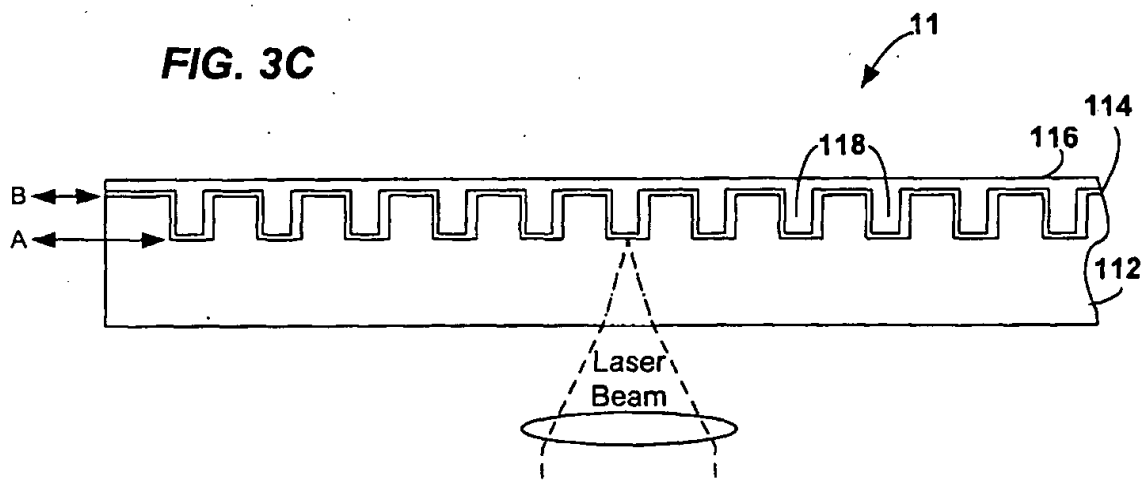


FIG. 3D

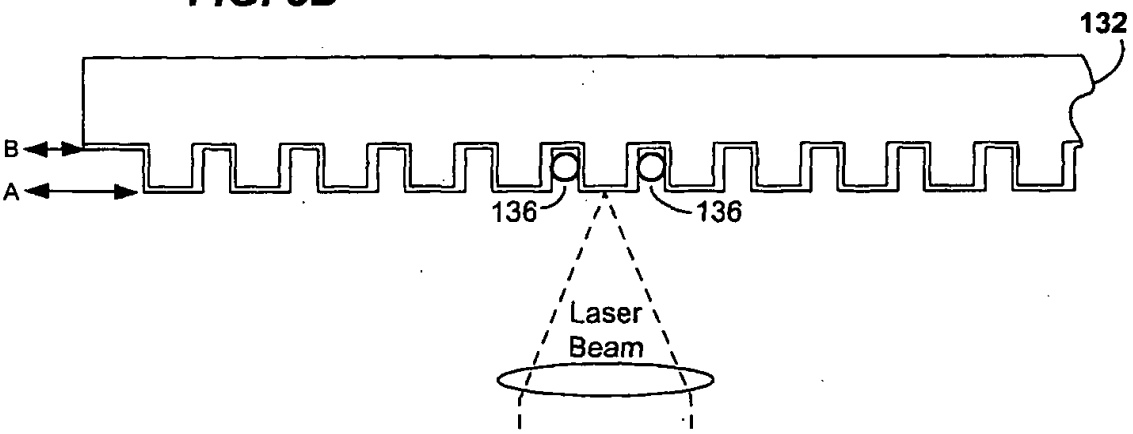
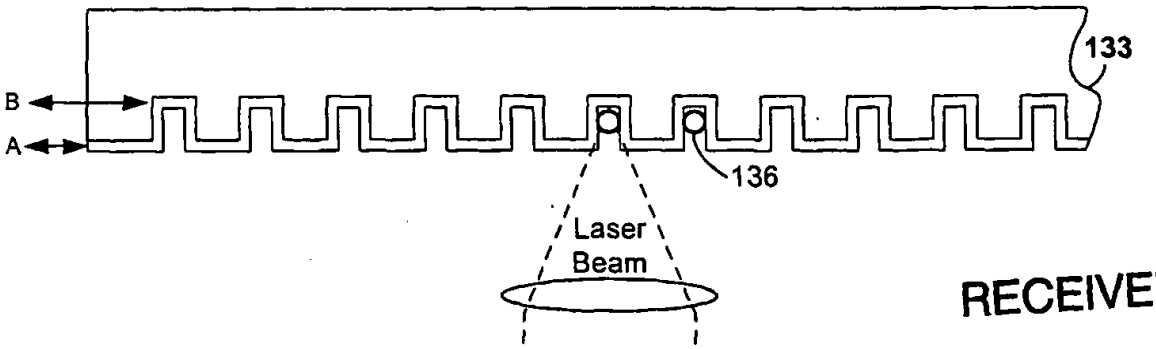


FIG. 3E



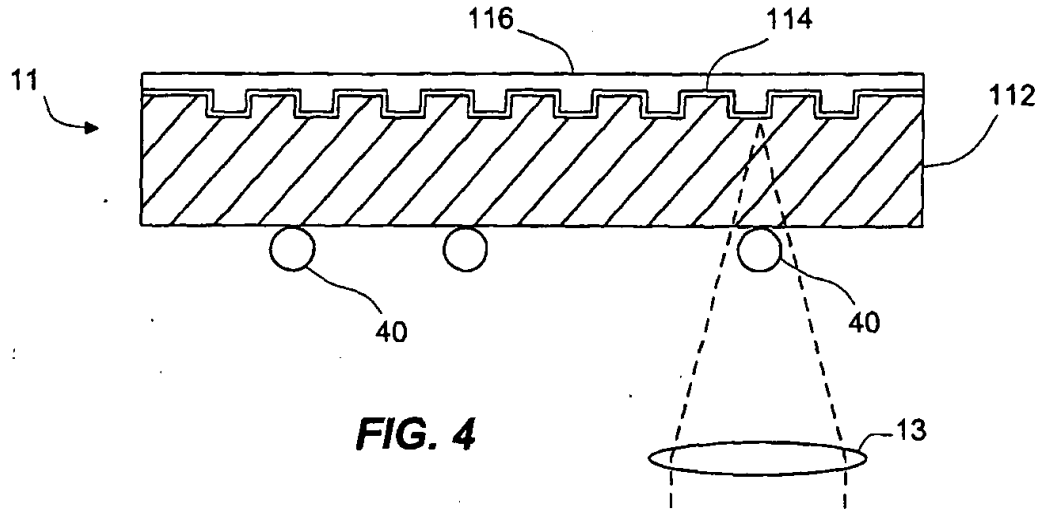


FIG. 4

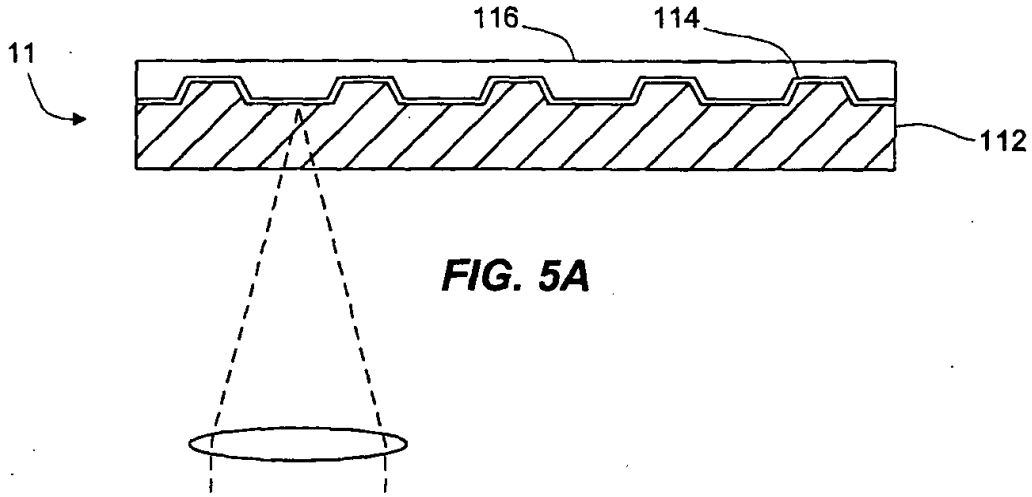


FIG. 5A

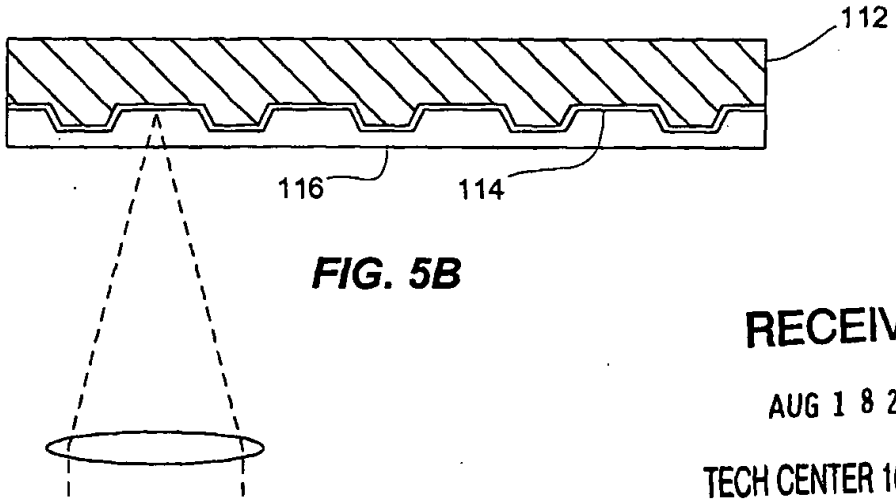


FIG. 5B

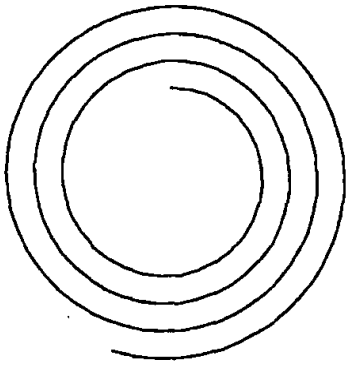


FIG. 5C

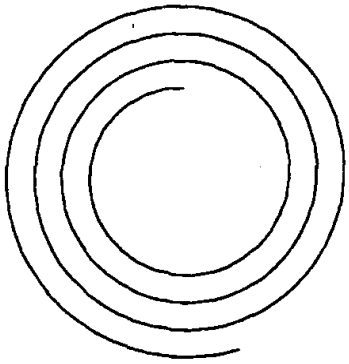


FIG. 5D

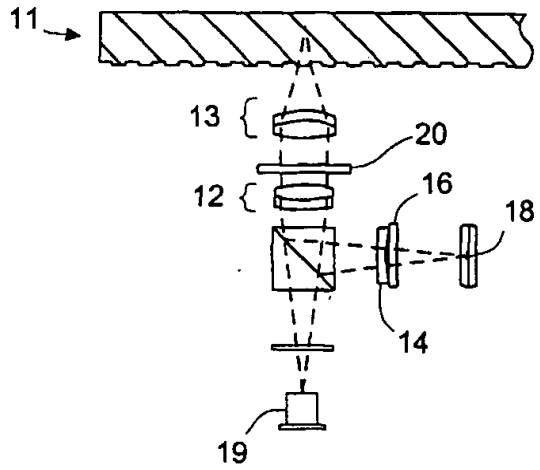


FIG. 6A

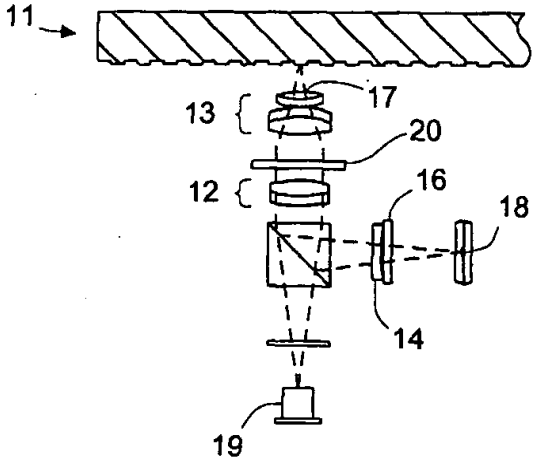


FIG. 6B

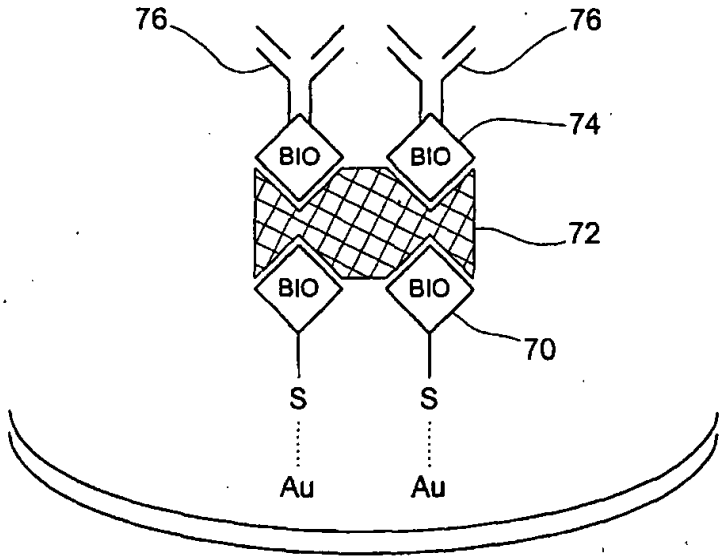


FIG. 7A

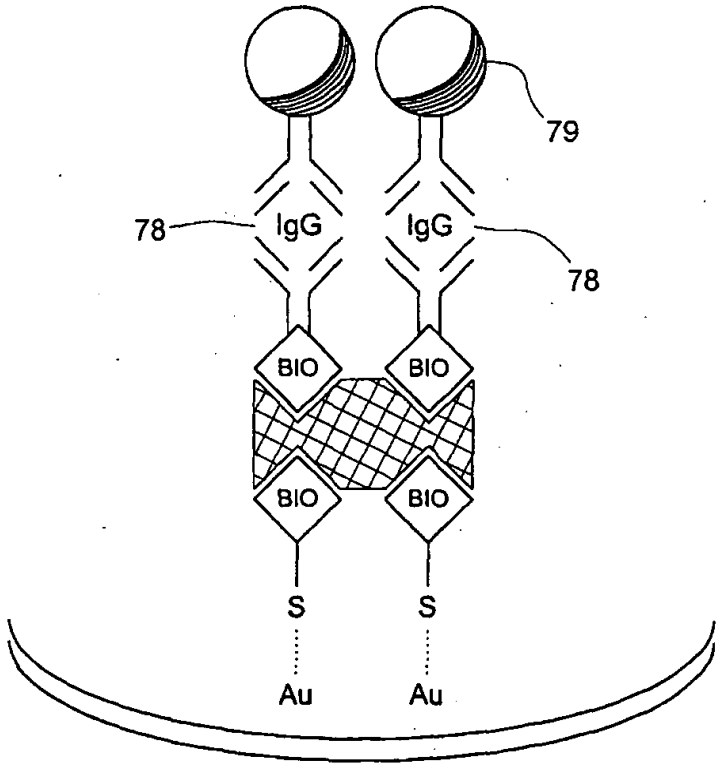
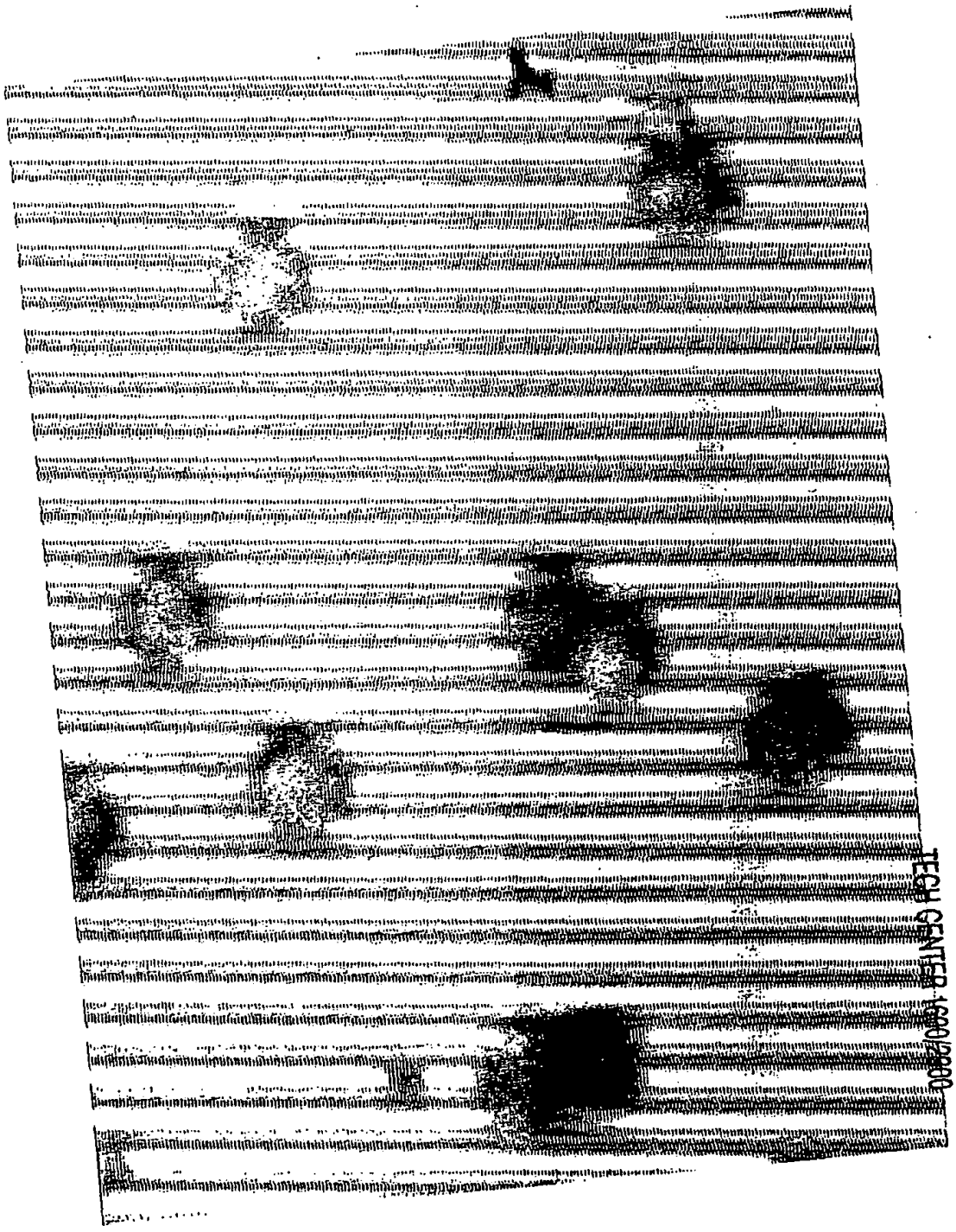


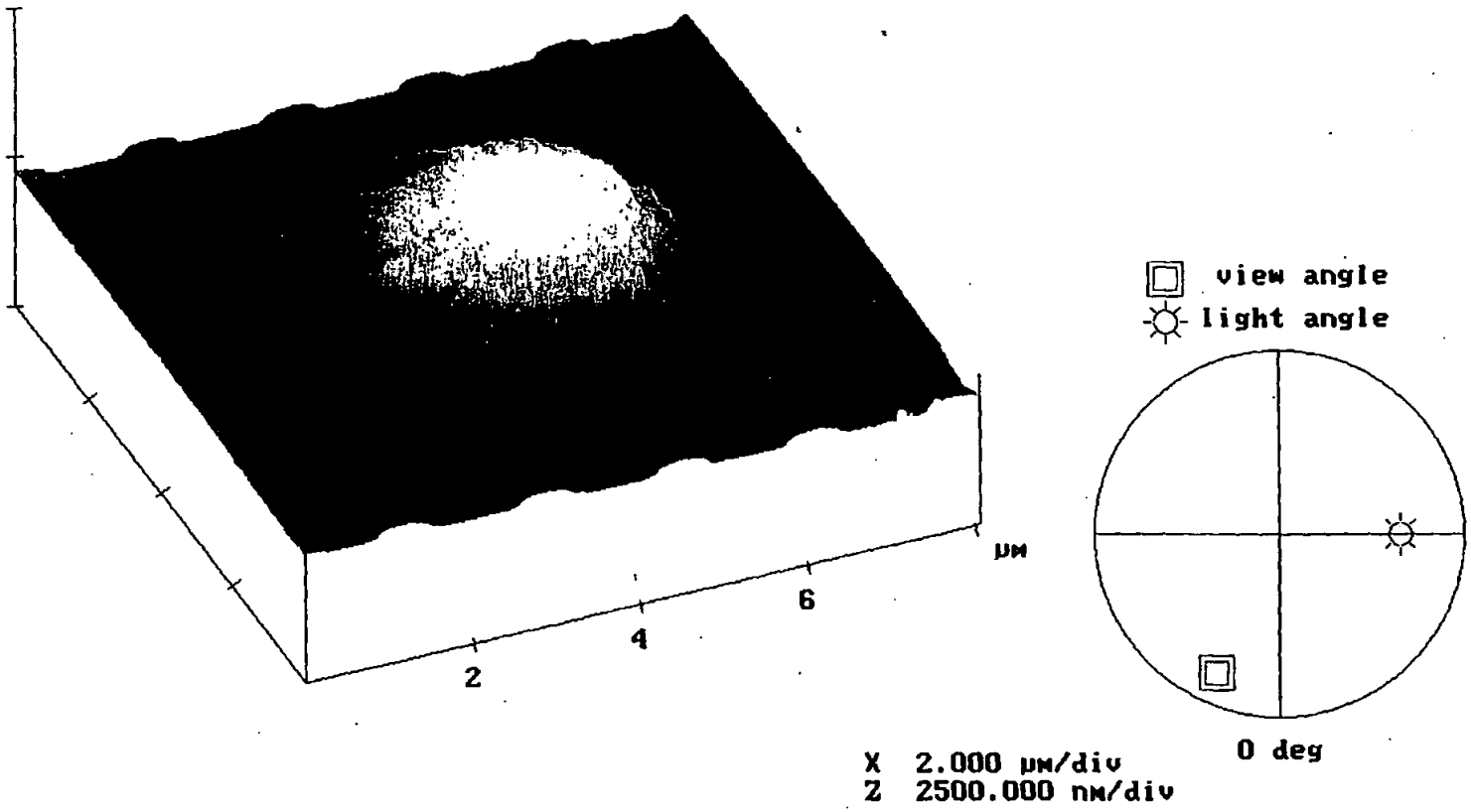
FIG. 7B

Title: TRACKABLE OPTICAL DISCS
WITH CONCURRENTLY READABLE
ANALYTE MATERIAL
Inventor: Mark O. Worthington
Docket No: BTI1 98100804(US)USX1P1X1

FIG. 8



Title: TRACKABLE OPTICAL DISCS WITH CONCURRENTLY READABLE ANALYTE MATERIAL
Inventor: Mark O. Worthington
Docket No: BTI1 98100804(US)USX1P1X1



Sphere on Wobble Groove

FIG. 9

Title: TRACKABLE OPTICAL DISCS WITH CONCURRENTLY READABLE ANALYTE MATERIAL
Inventor: Mark O. Worthington
Docket No: BT11 98100804(US)USX1P1X1

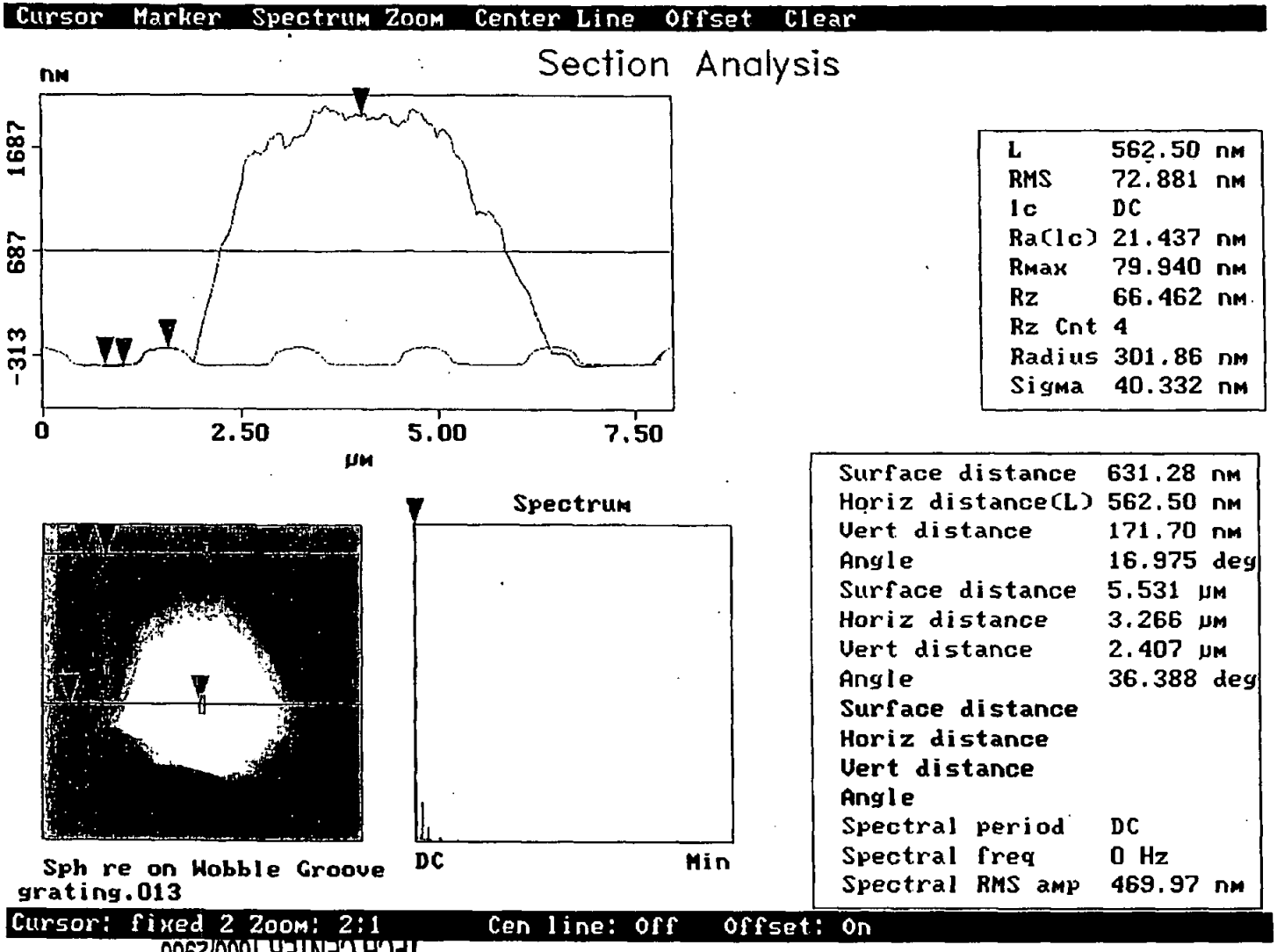


FIG. 10

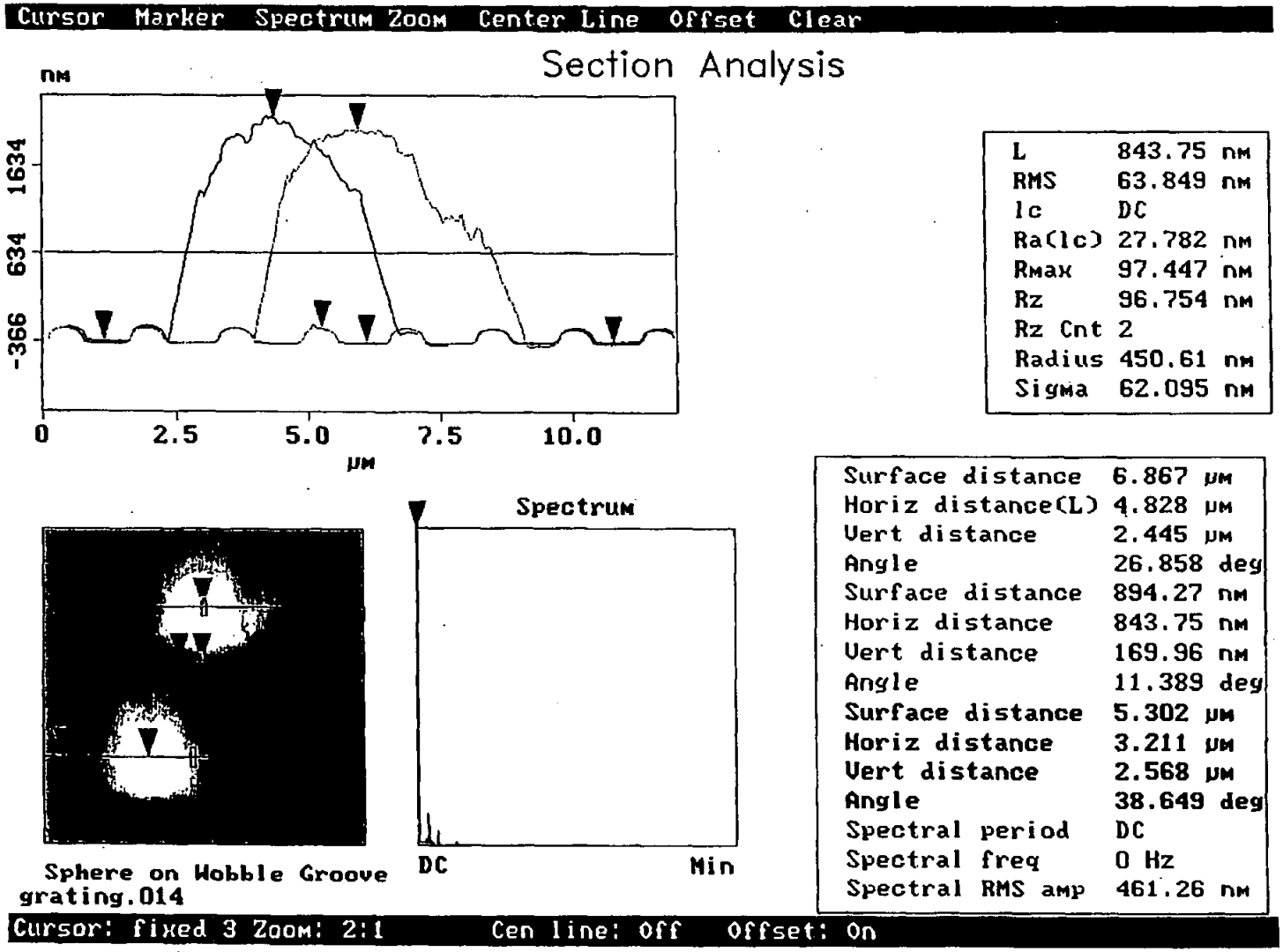


FIG. 11

Title: TRACKABLE OPTICAL DISCS WITH CONCURRENTLY READABLE ANALYTE MATERIAL
Inventor: Mark O. Worthington
Docket No: BT11 98100804(US)USX1P1X1

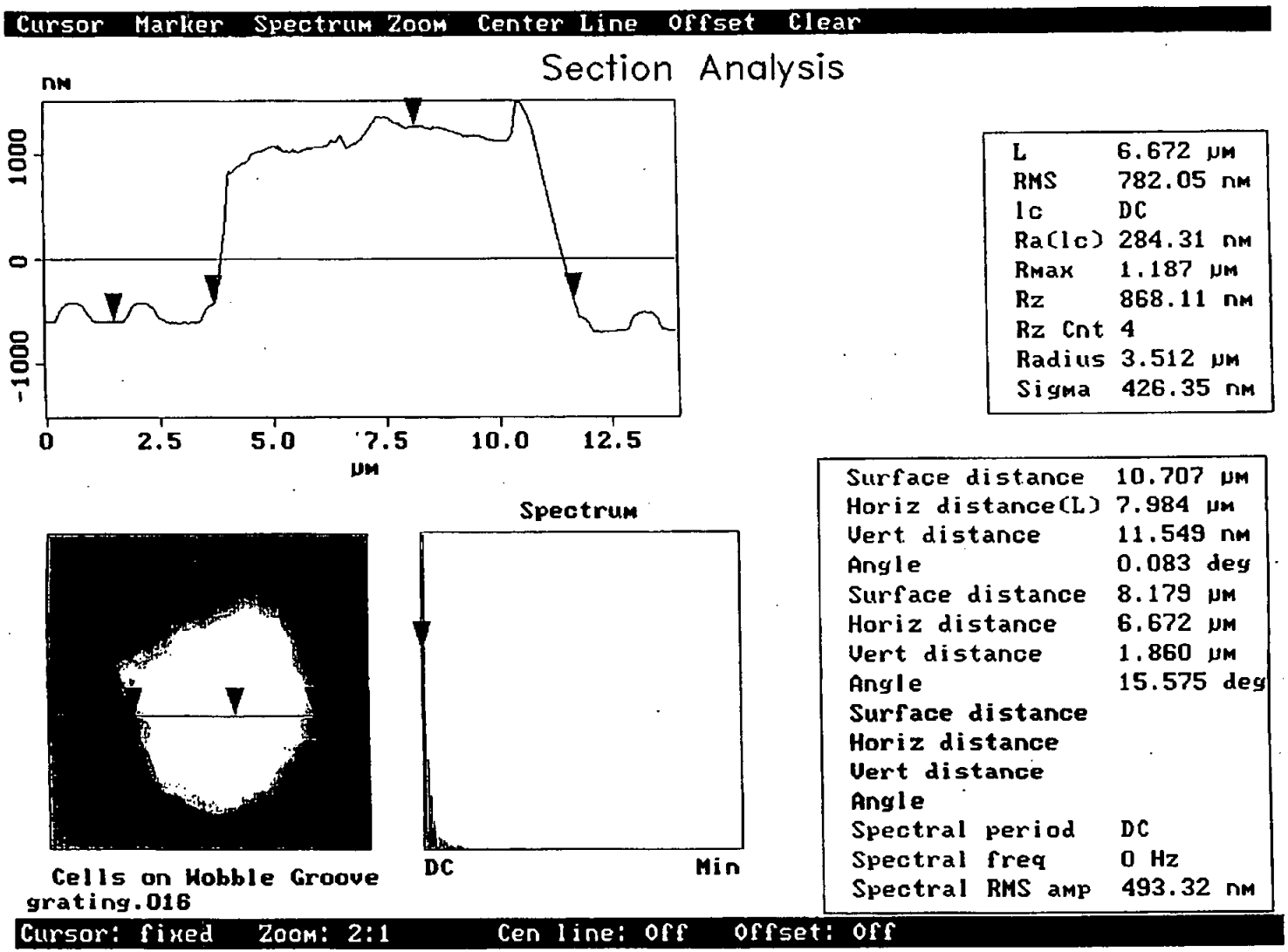


FIG. 12

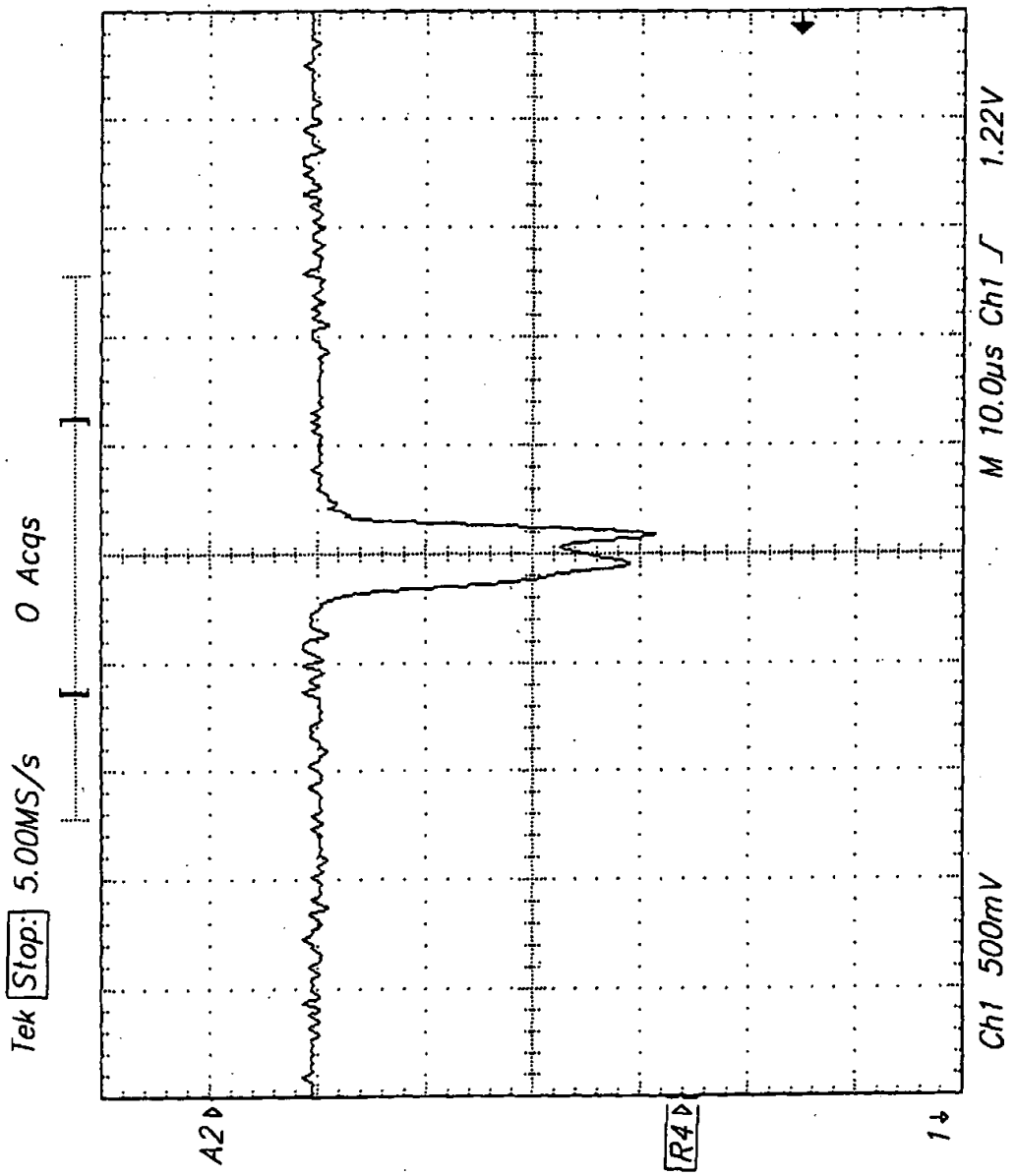


FIG. 13

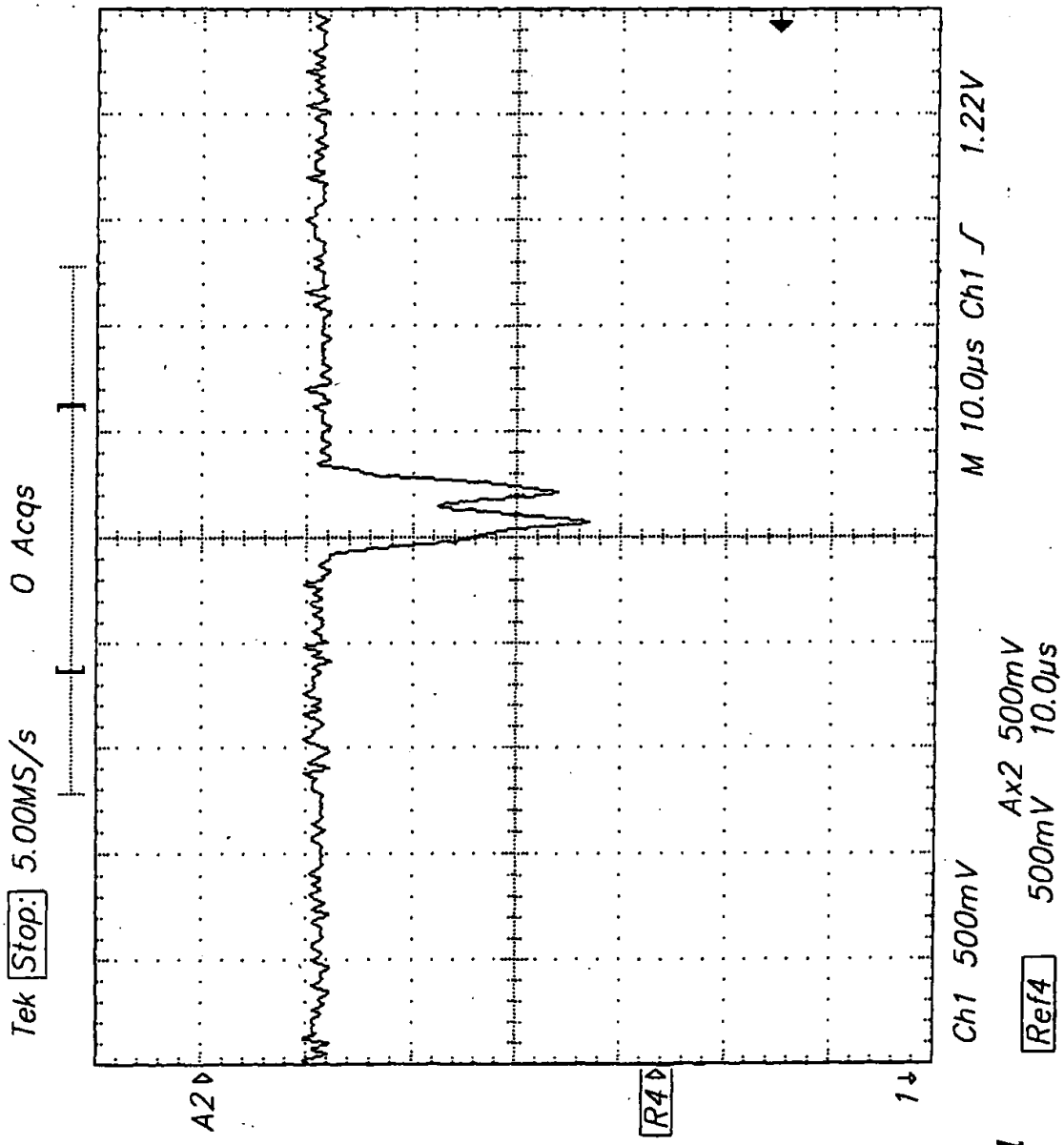


FIG. 14

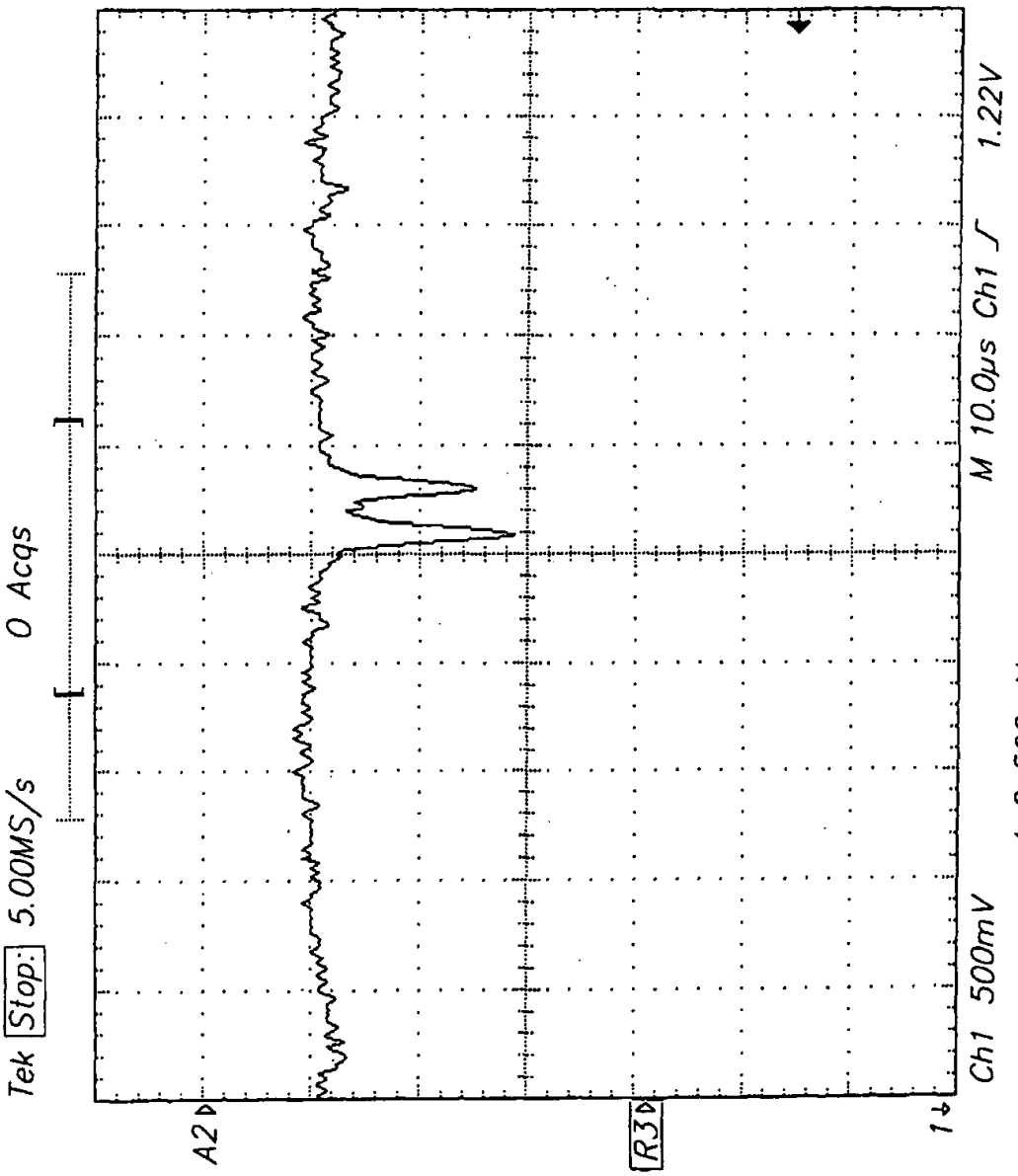


FIG. 15

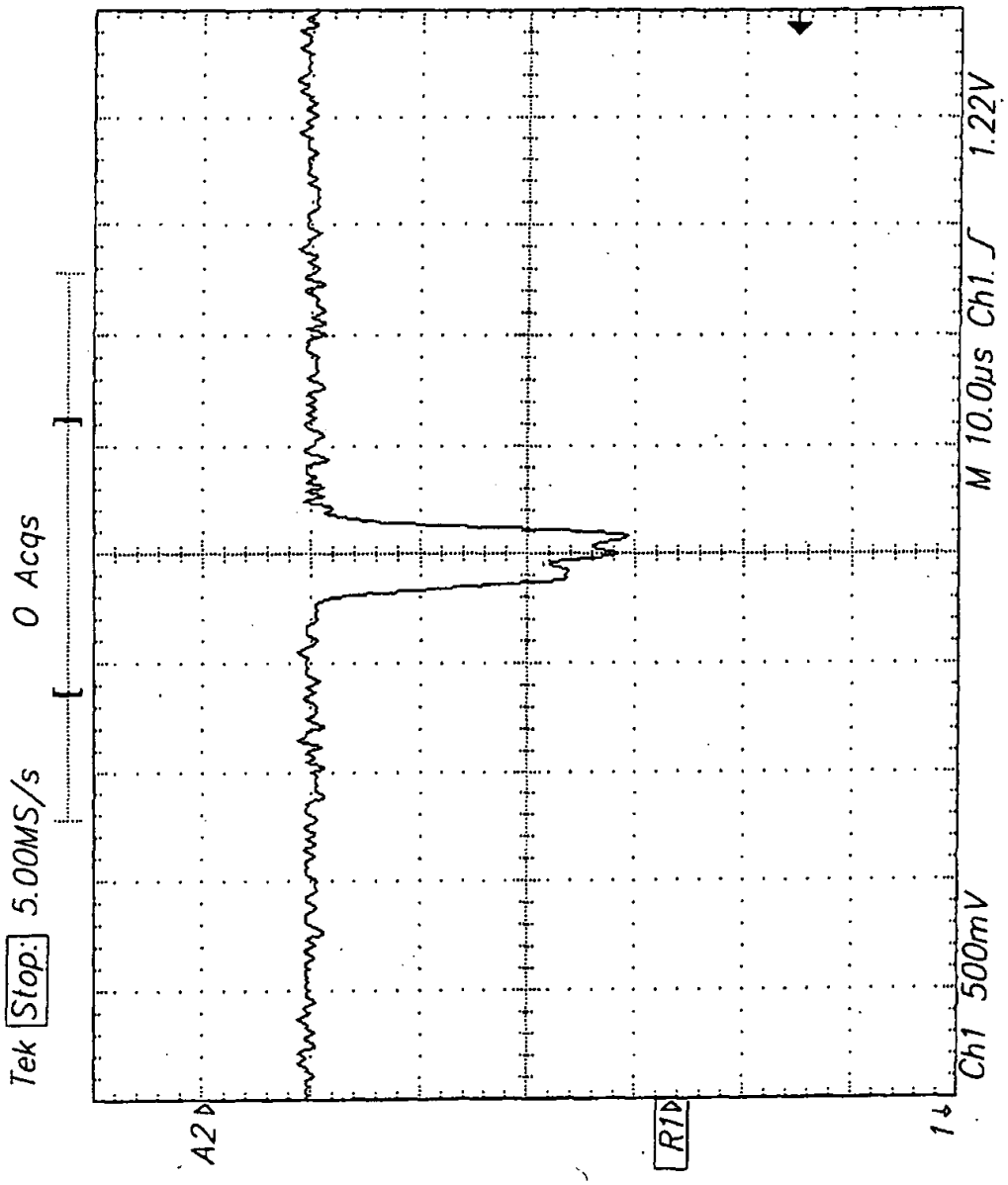


FIG. 16

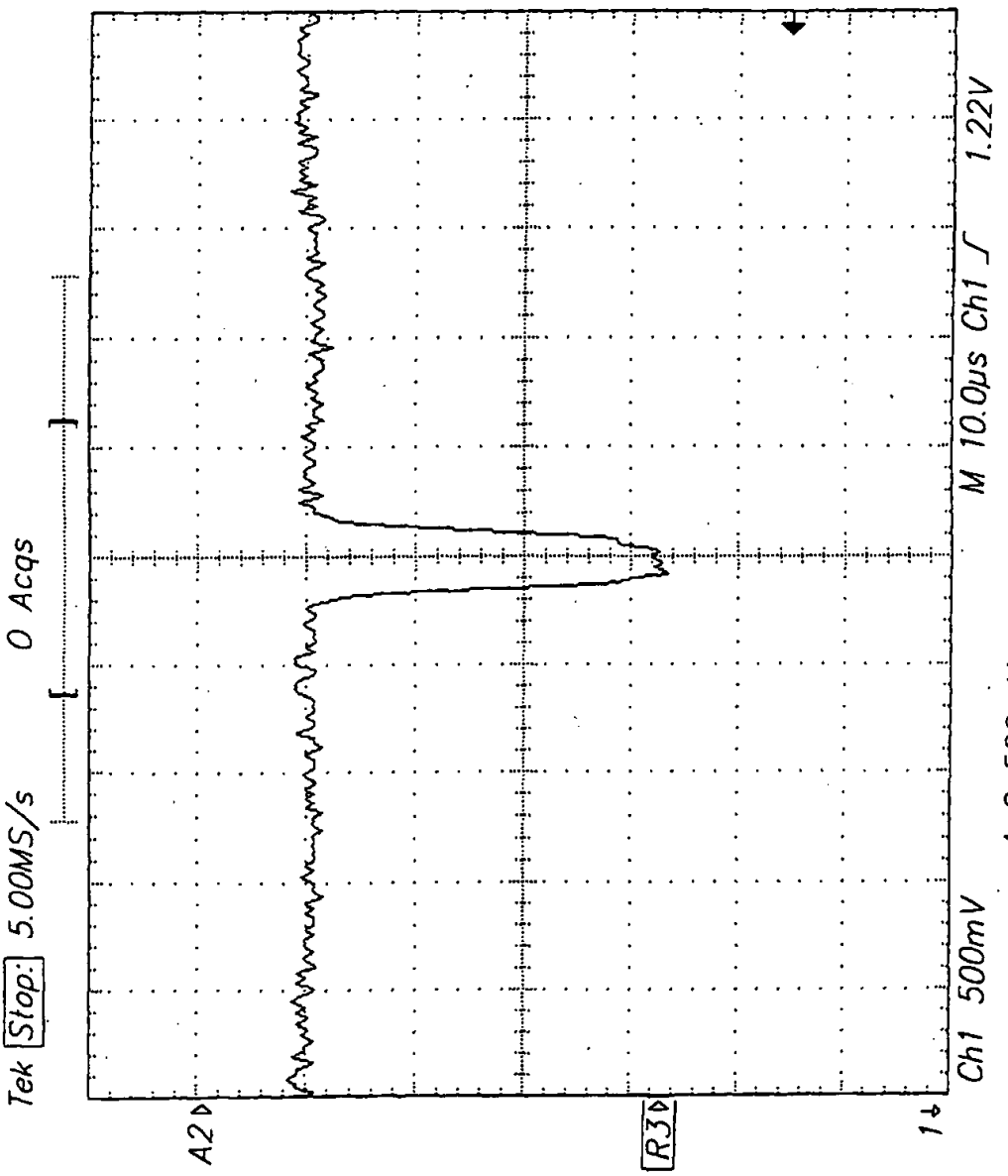


FIG. 17

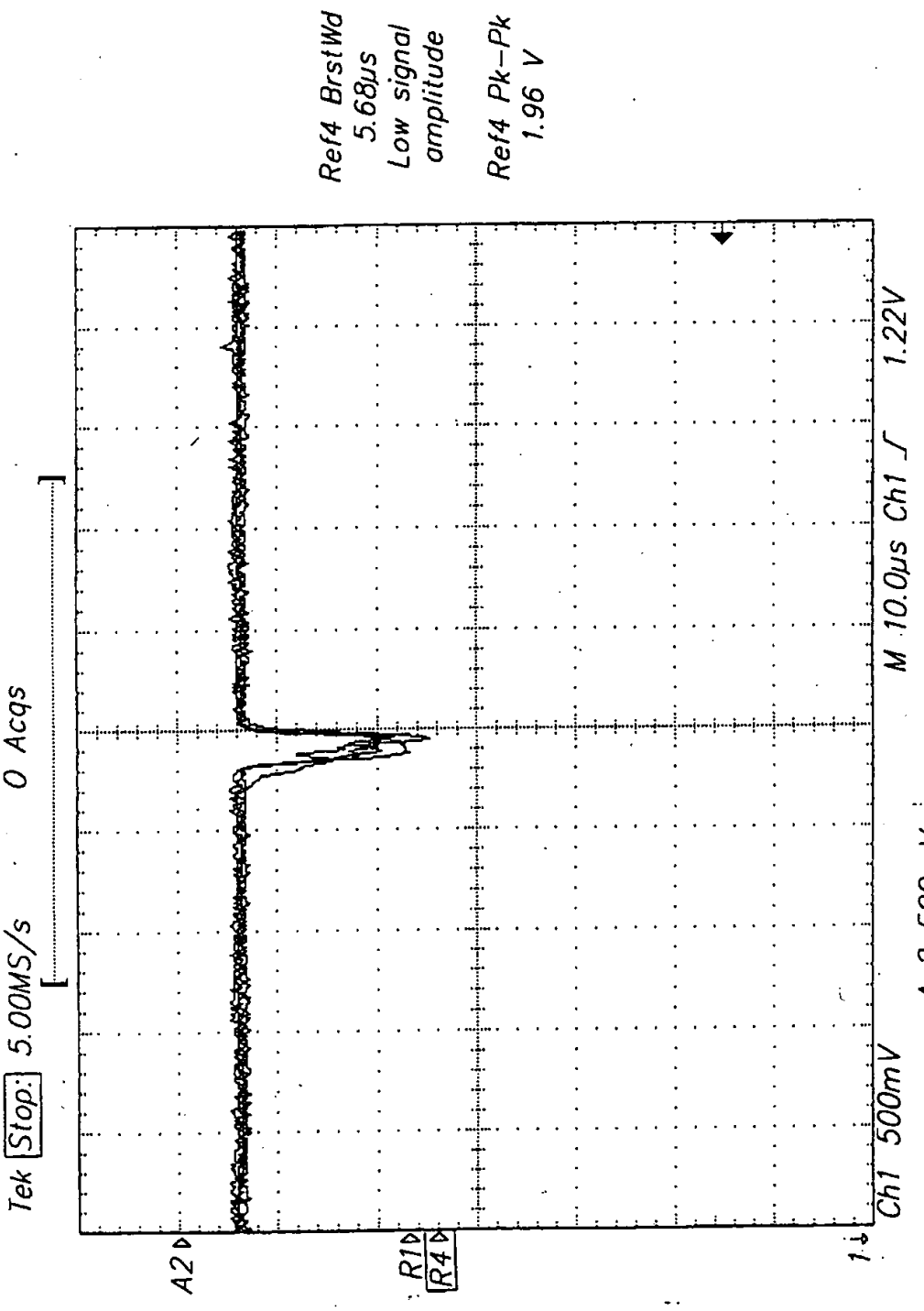


FIG. 18

FIG. 19

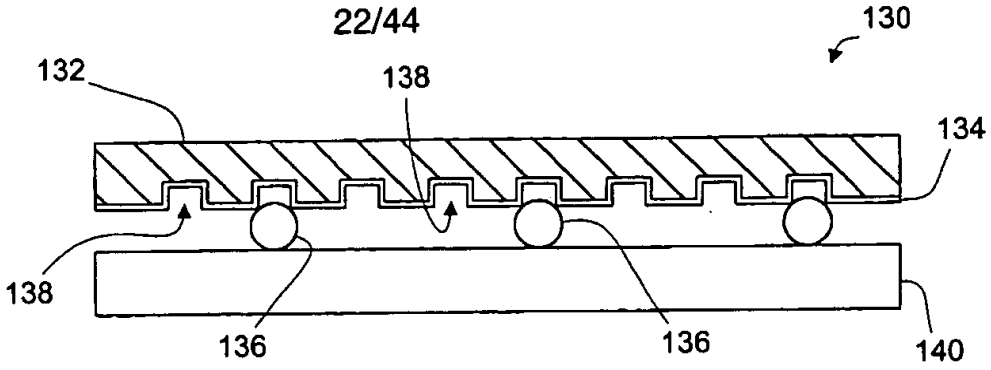


FIG. 20

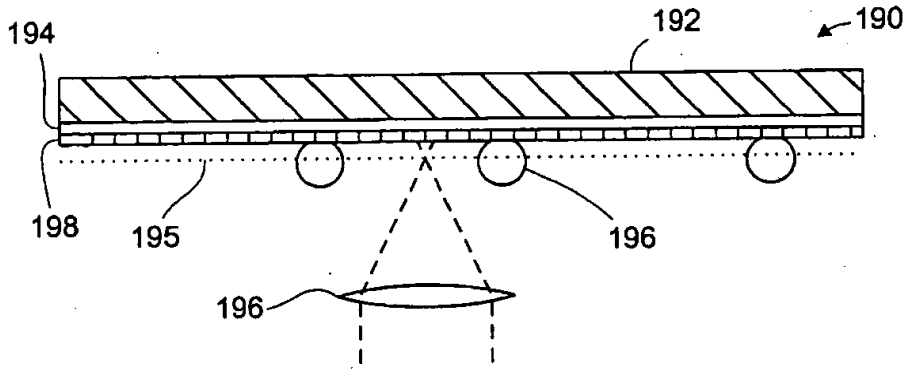
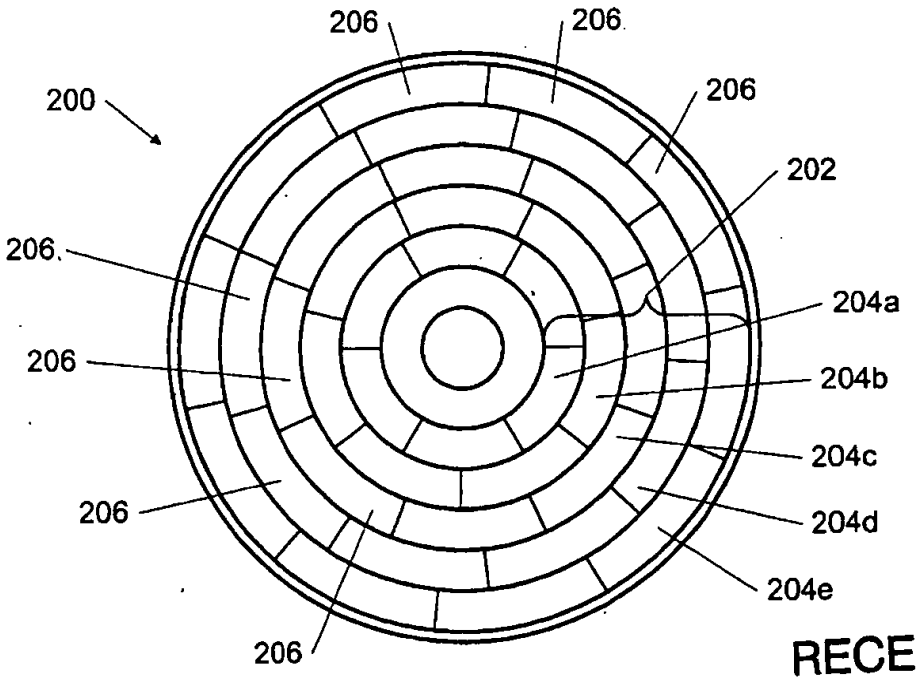


FIG. 21



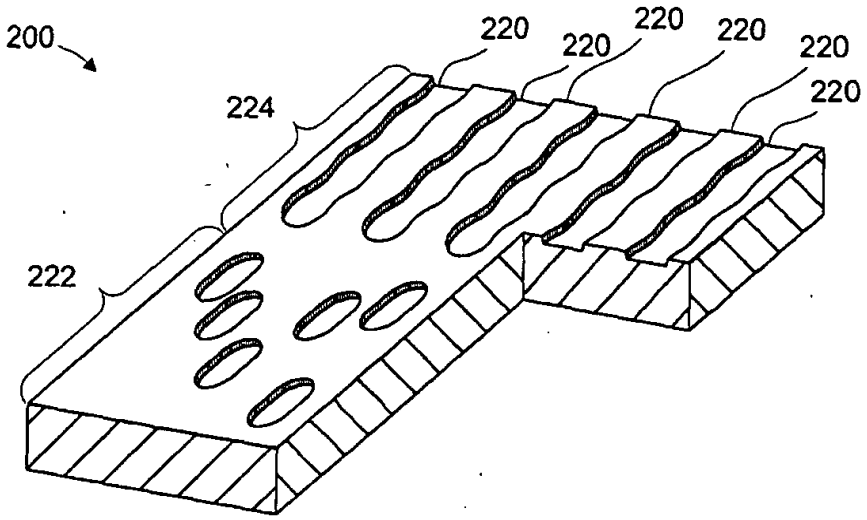


FIG. 22

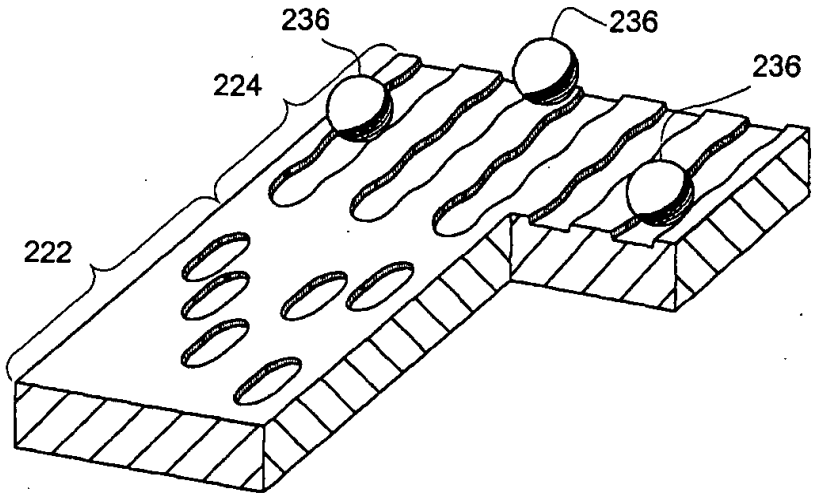


FIG. 23

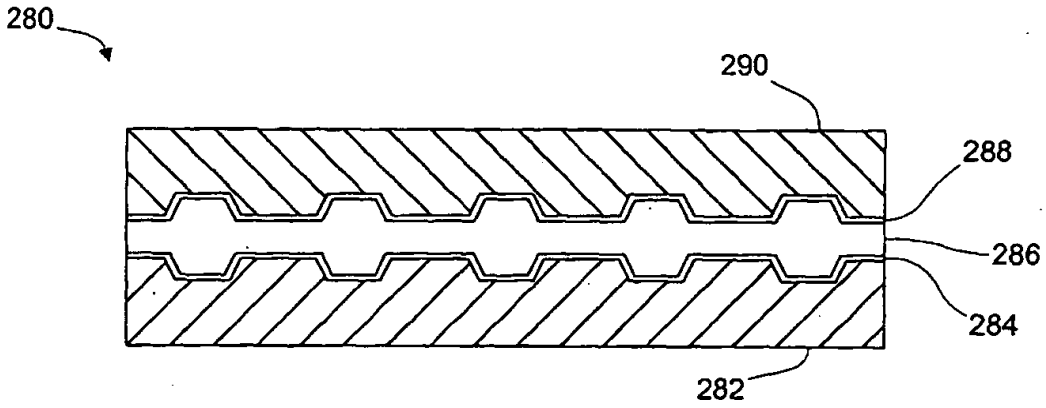


FIG. 24

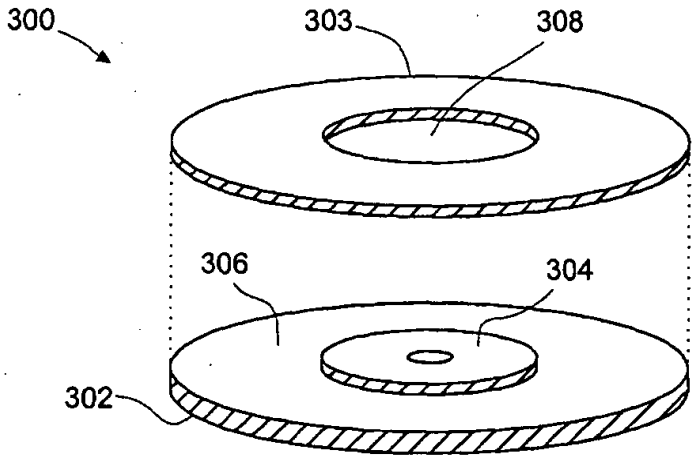


FIG. 25

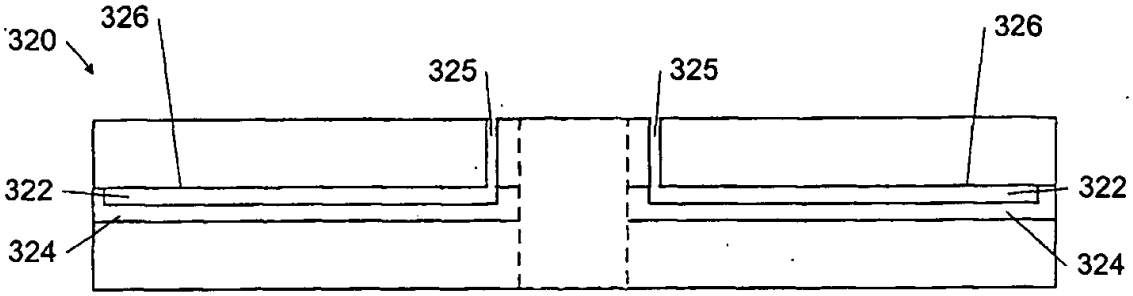


FIG. 26

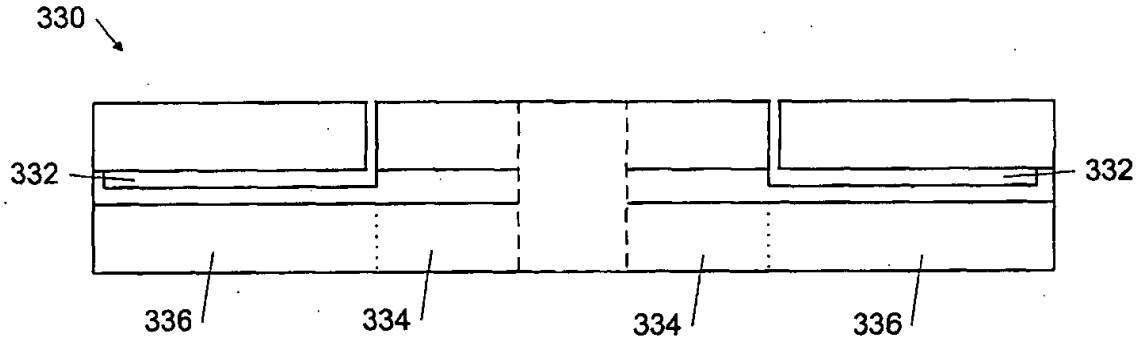


FIG. 27

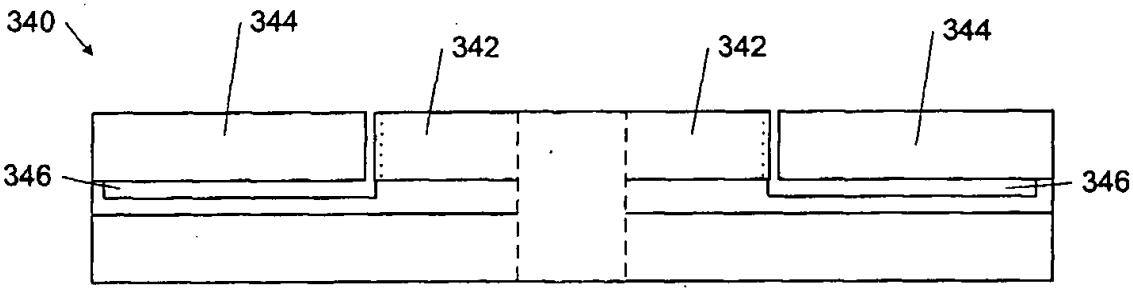


FIG. 28

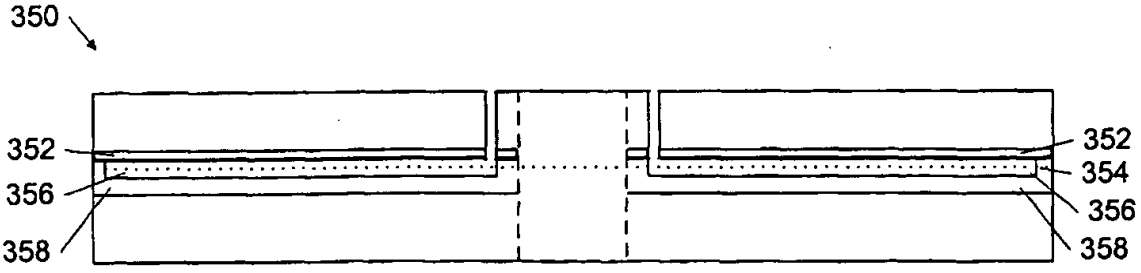


FIG. 29

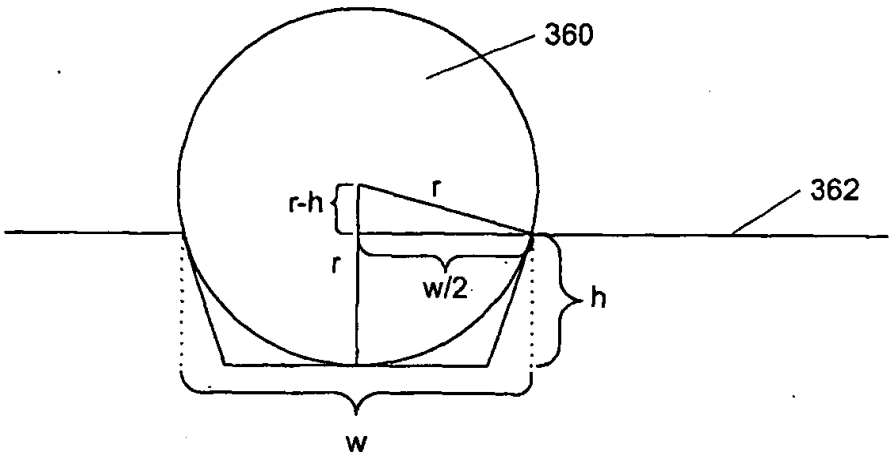


FIG. 30

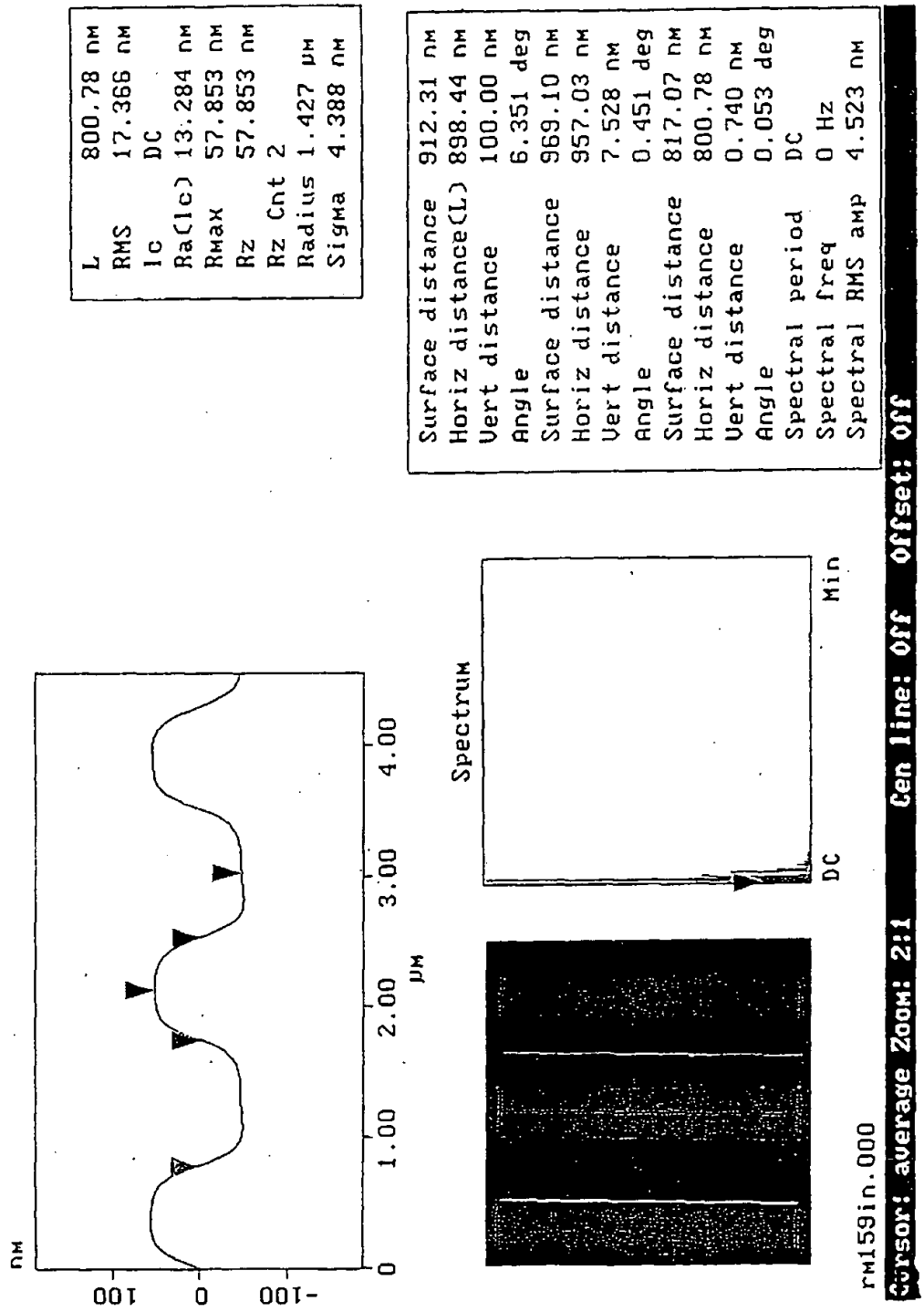


FIG. 31

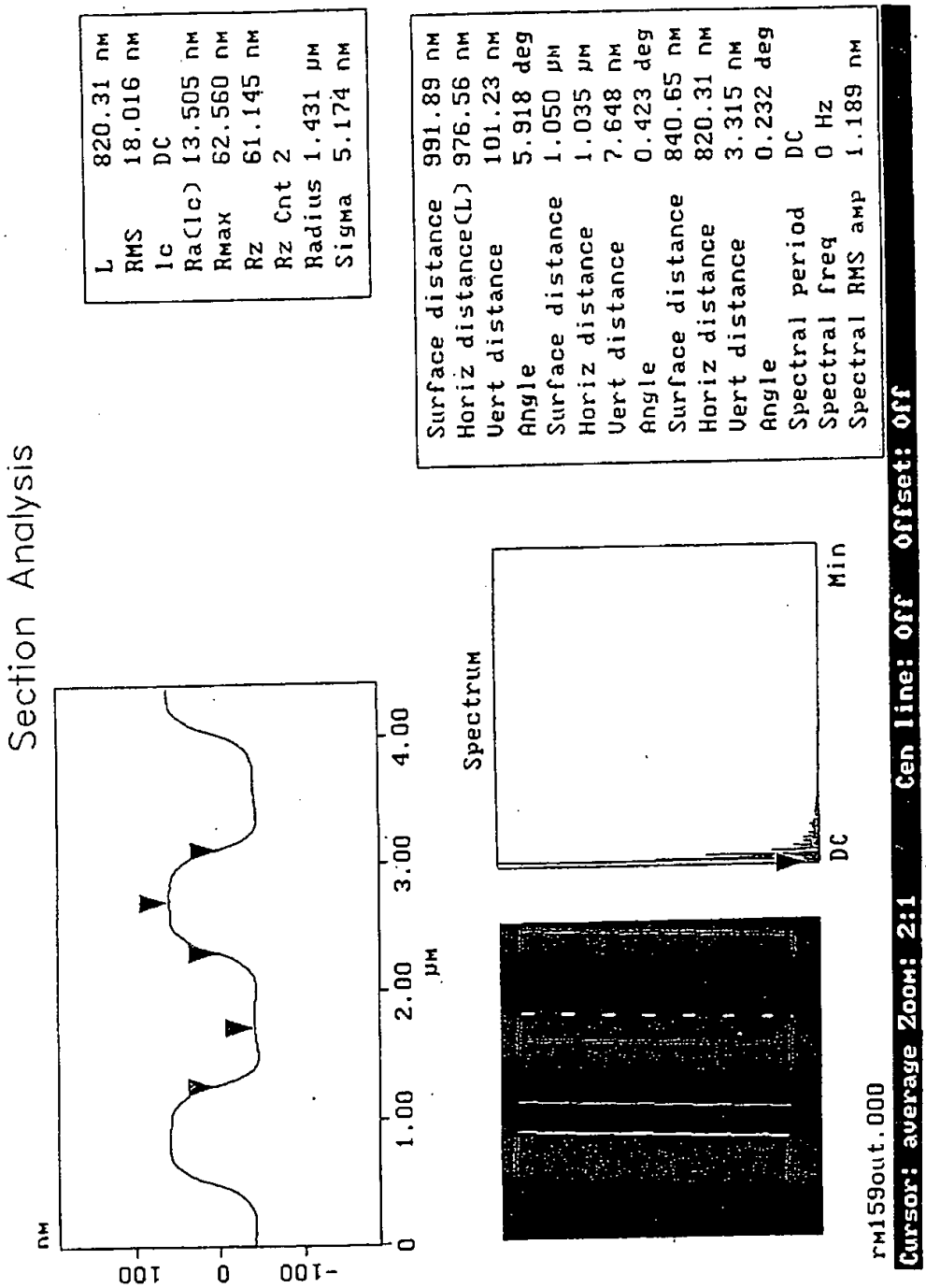


FIG. 32

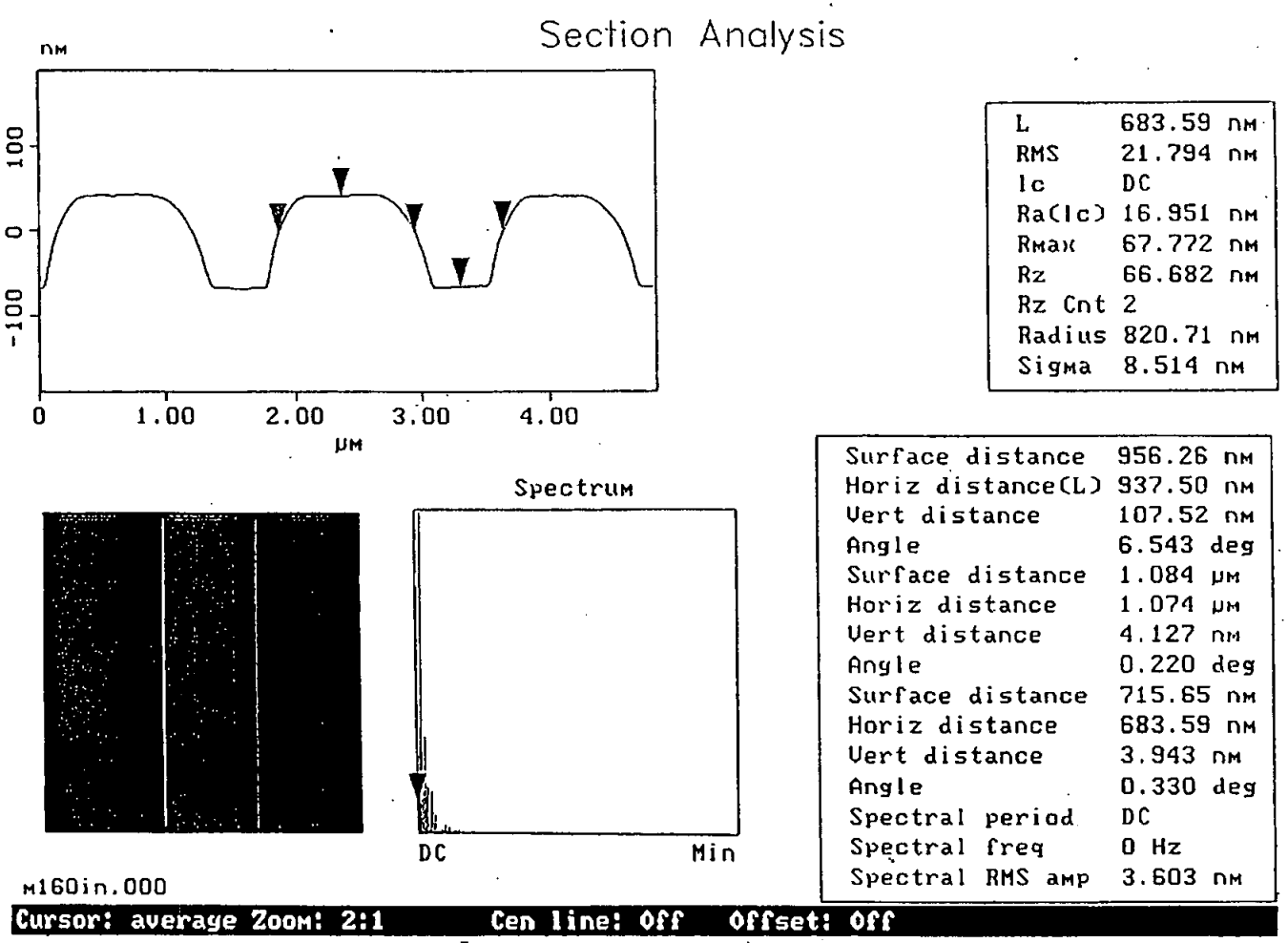


FIG. 33

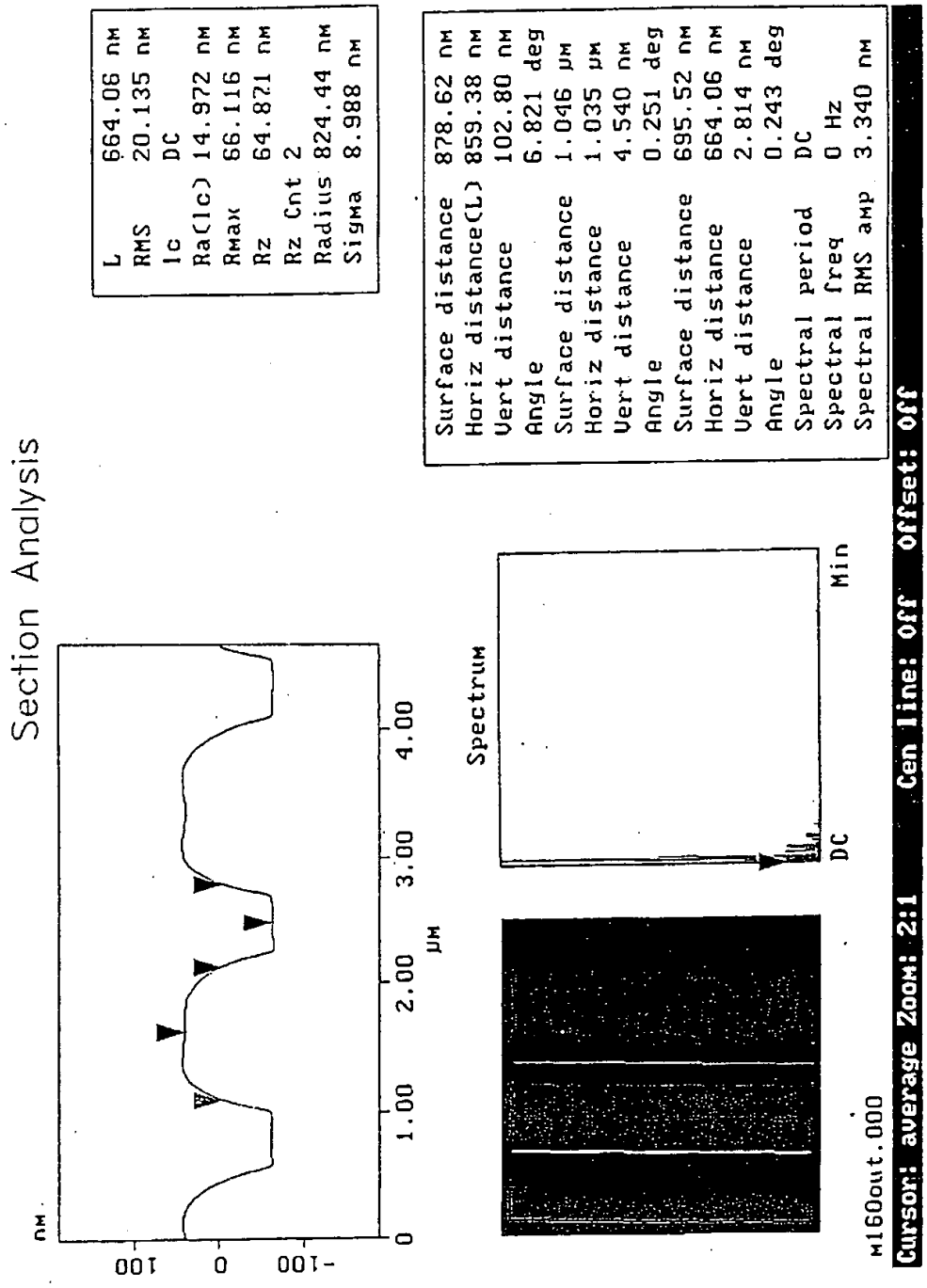


FIG. 34

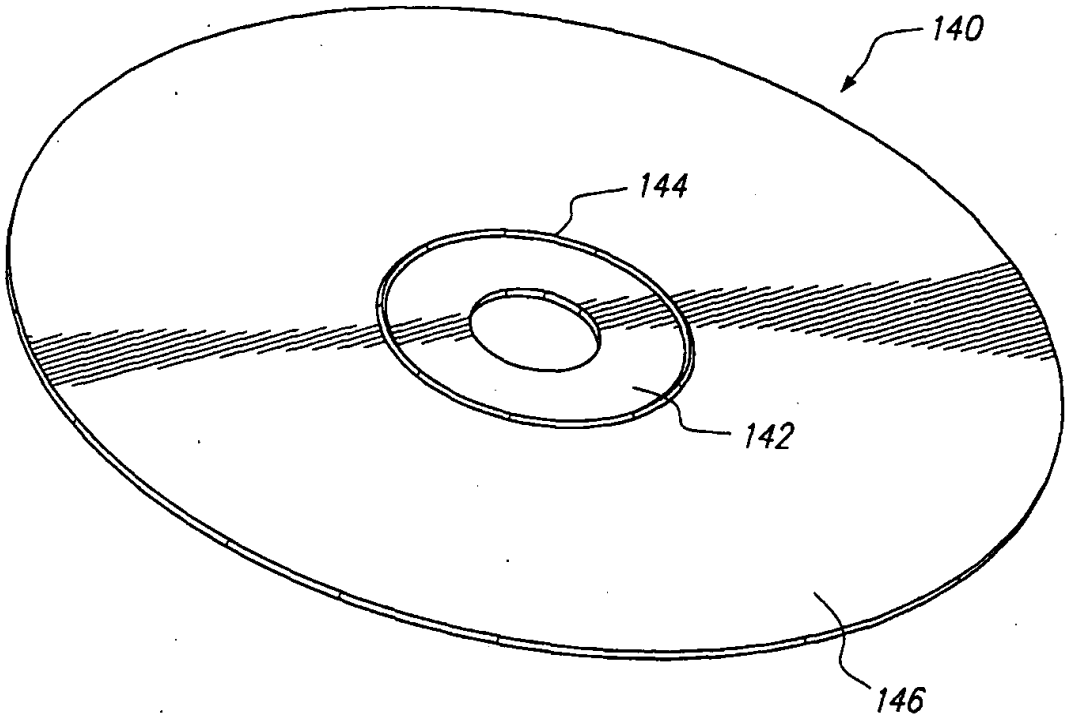


FIG. 35

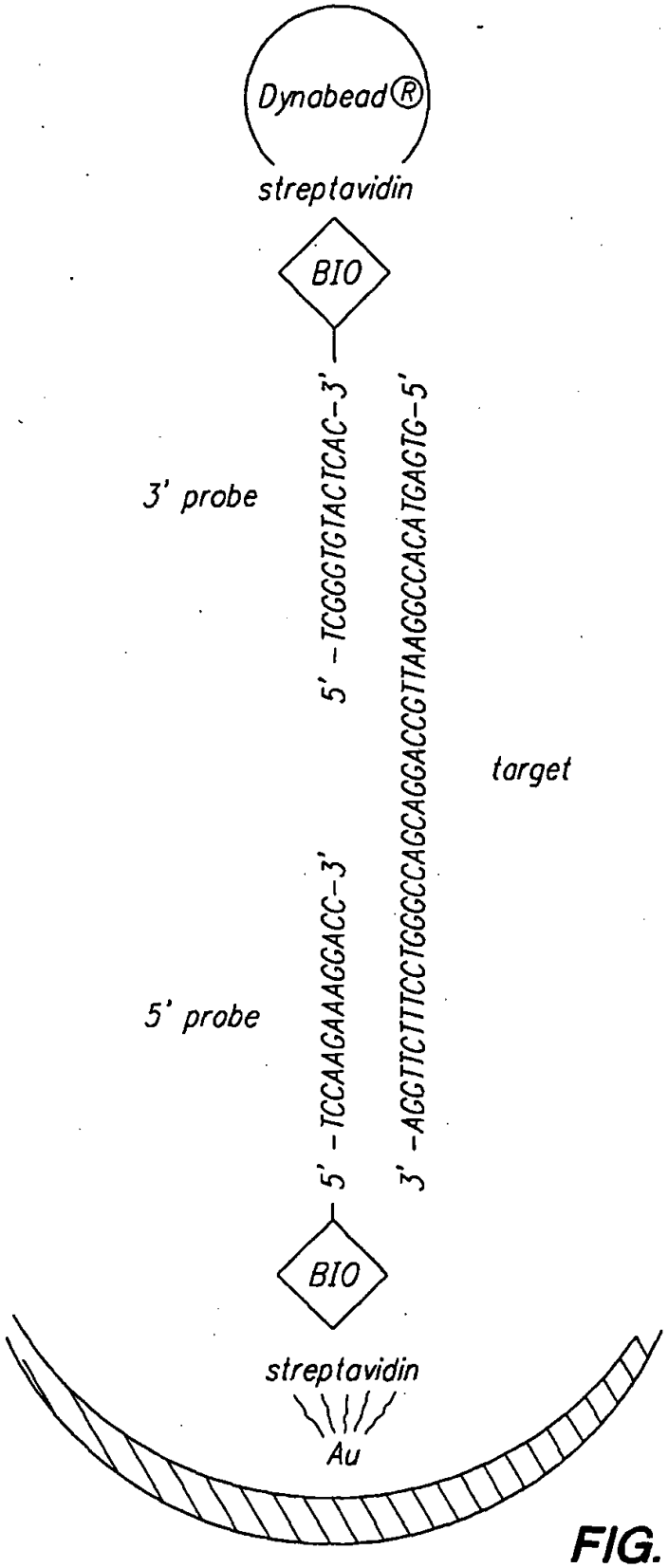


FIG. 36

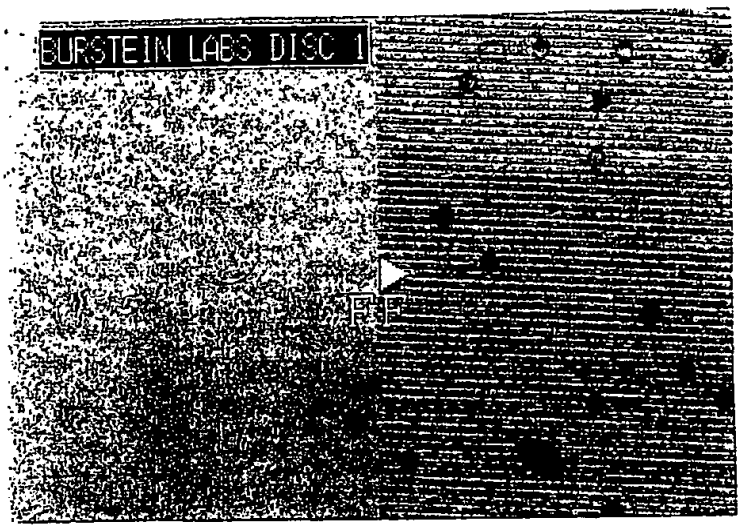


FIG. 37A

20 femtomoles

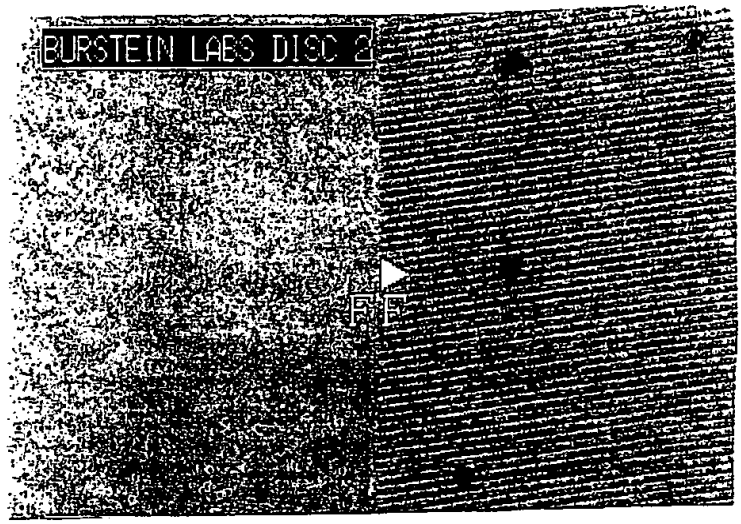


FIG. 37B

20 attomoles

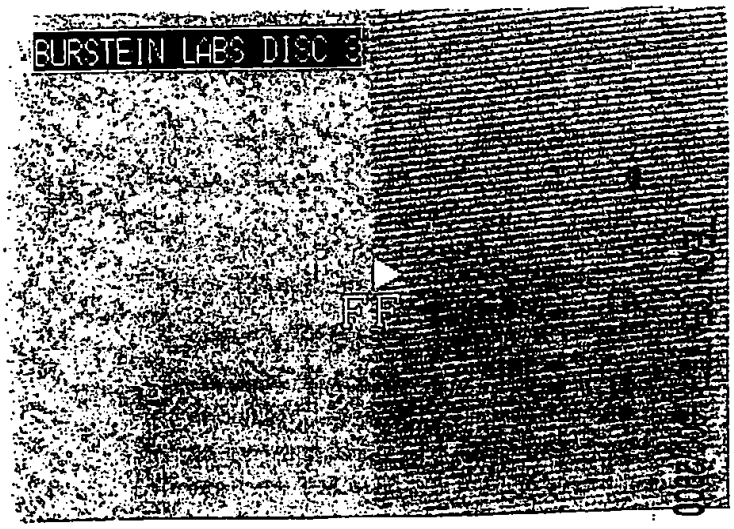
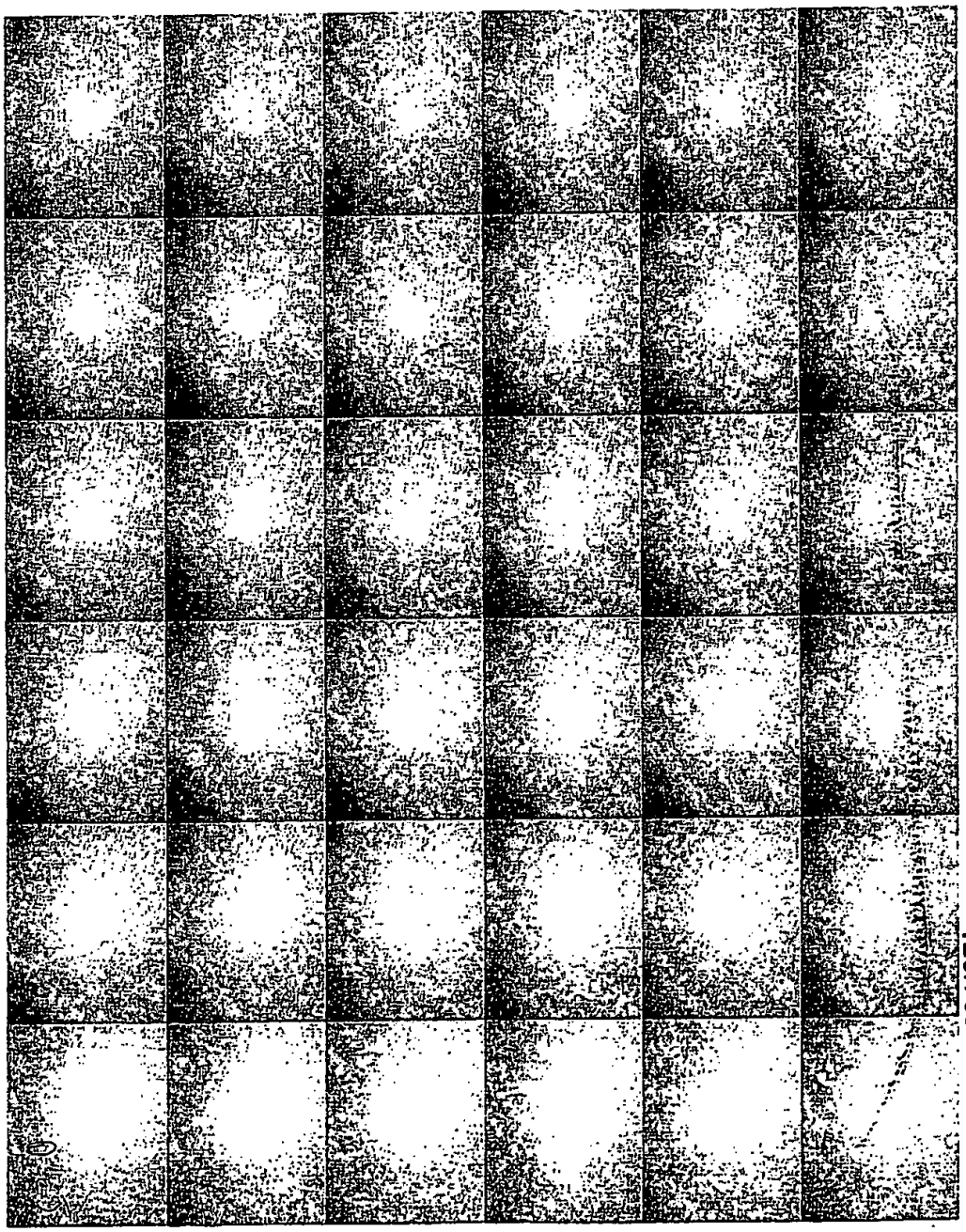


FIG. 37C

20 zeptomoles

FIG. 38



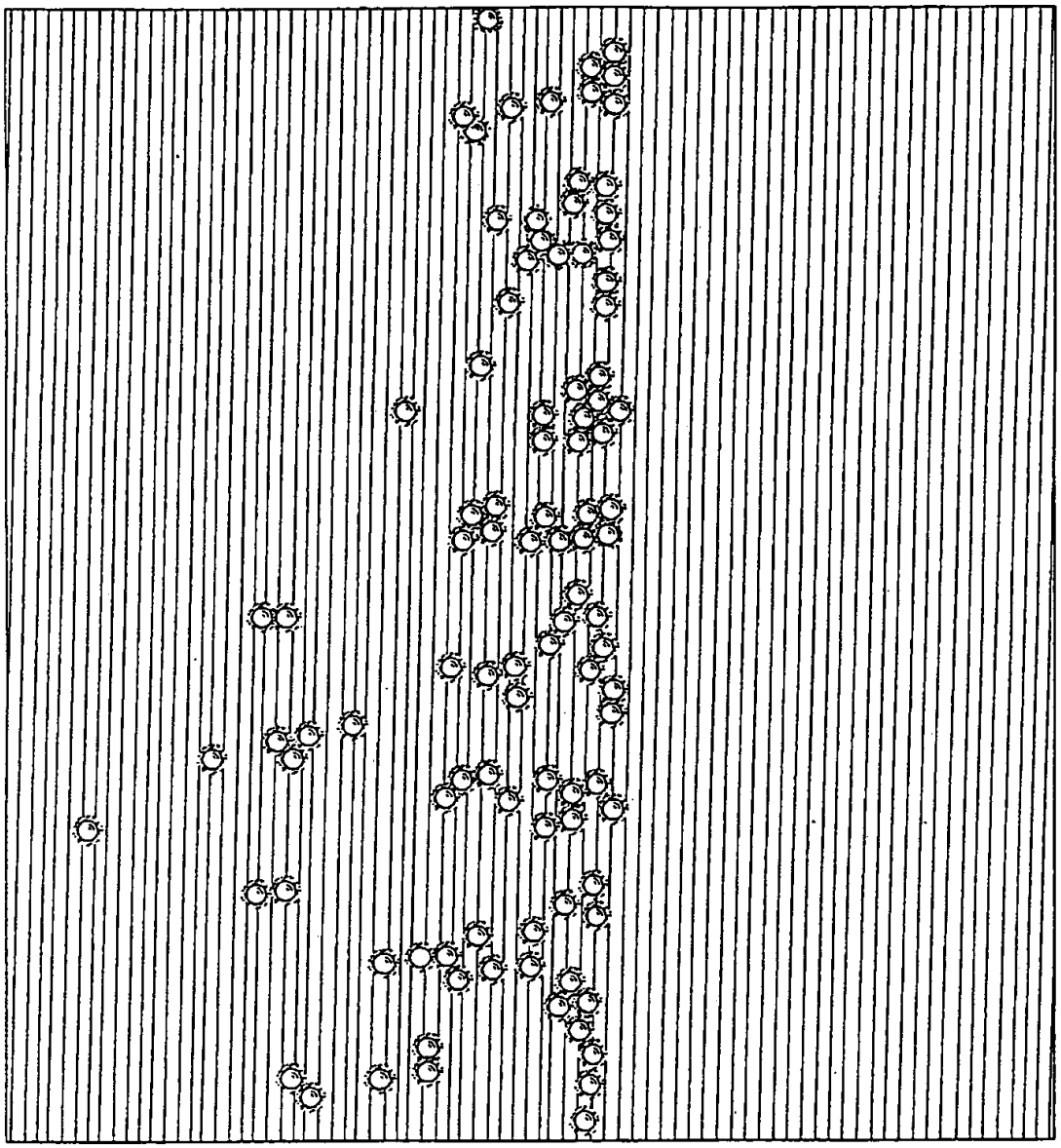


FIG.39

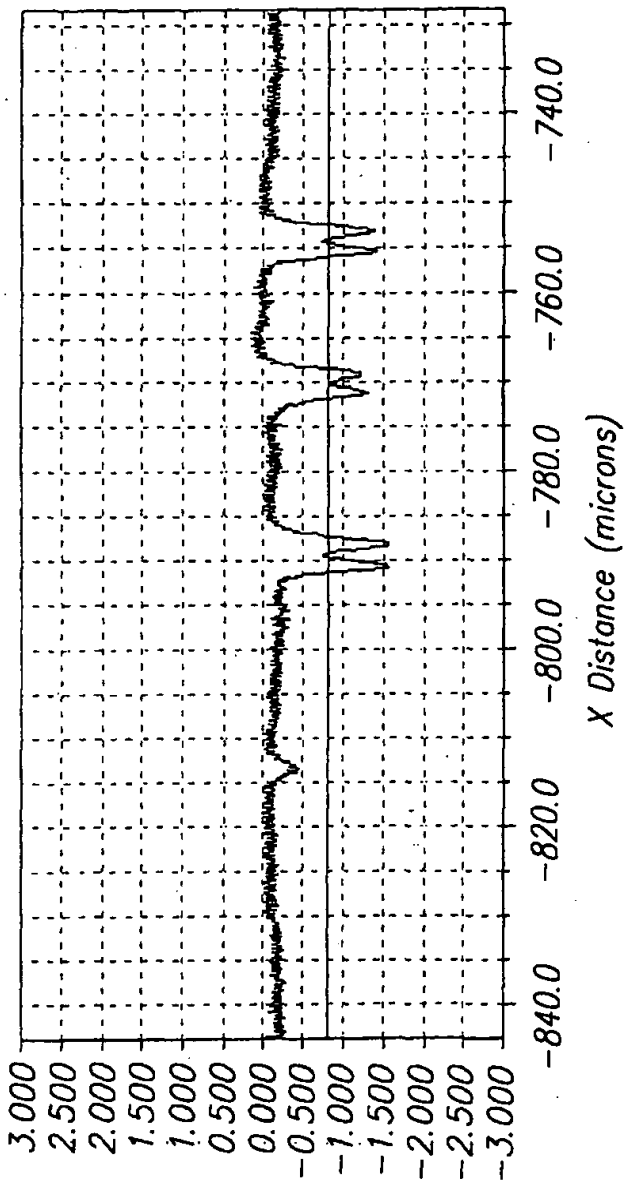


FIG. 40

AWM Muri	Supplementary sheet, mold acceptance test				CD-3-AWM
Job No	36-10236	Agent	CR-R	Ram hold	vac + mech
SM Order No	9N.96293	Customer	Eximpo CS	Ram dia.	24

IFPI –
Product Code No. 256

Dimensions		0°	90°	180°	270°	
0°=mold at top	R15	1.15	1.155	1.15	1.15	mm
Thickness	R40	1.155	1.155	1.155	1.155	mm

Center hole 15.05+/−0.3 15.05 Drm. 120+/−0.3 mm

Weight in g	Min	0	15	30	45	60
Measure every 15 min.	g	15.26	15.27	15.26	15.26	15.26
during test	g		15.26	15.26	15.26	15.26
Max. diff±0.1 g						

Water in mold	ACTUAL		DESIRED	Tol.
Sprue bush	9	ltr./Min.	7	−1/+3
Embosser	6	ltr./MIN.	7	−1/+3

Vacuum		without	with	diff.	tol.
Handling	bar				
Ram	bar				

Mold Function	
Embosser	✓
Sprue ejector	✓
Ejector sleeve	✓
Sprue bush	✓

Air outlet	
FS dia.	✓
BS dia.	✓

Raw material
Makrolon 2005 ✓
Lexan 1020
Panlite 5503

Visual faults			
Streaks	1/4	Center hole	✓
	1/4	Stacking groove	✓
	1/4	Info	✓
Clouds	1/2		✓
Voids	1		✓
Black dots	3		✓
Matt outer edge	3		✓
Burrs	3		✓
	3	Center hole	✓
	3	Outer Edge	✓
Scratches	3		✓
Diesel effect	3		✓
Brown Discoloration	5		✓

Molding compound cold	
Thickness of cavity (3)	1.462
Venting gap (5)	0.33
Position of embosser (9)	0.876
Position of spure bush (10)	0.162
Embossing stroke	0.7

Measuring means	
Polarized light	1
Halogen light	2
Neon Light	3
Black (UV Light)	4
White paper	5
Micrometer	6
Balance	7

FIG. 41A

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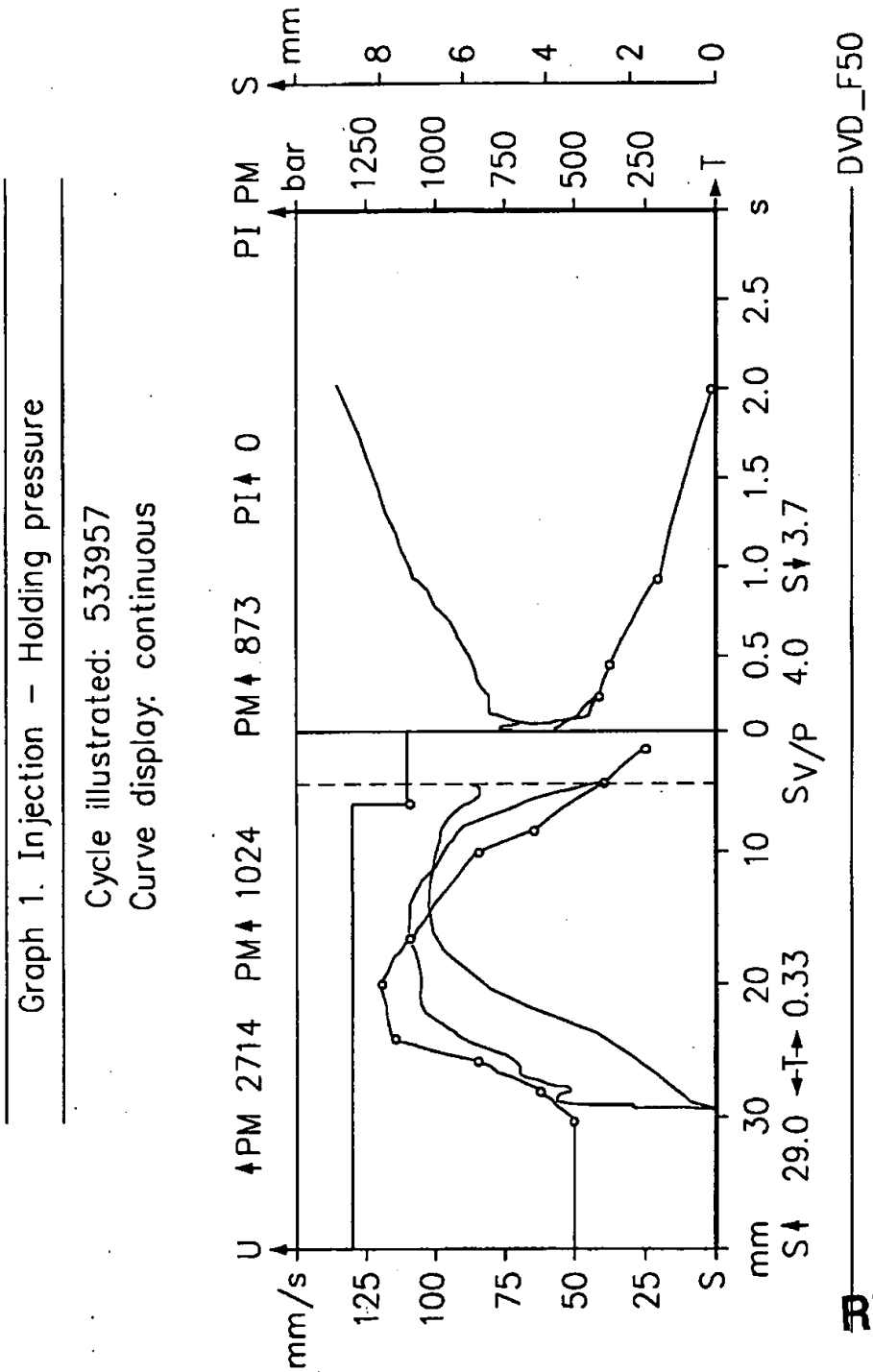

FIG. 41B

01.01 Mold movement

Closing movement		Closing time	T32	=	000.
	V33 =100%	S33 = 019.0mm			
Pressure initiation	V34 =100%	S34 = 000.7mm			
Opening movement		Opening time	T36	=	000.
	V41 =100%	S41 = 055.0mm			
Braking	V42 =010%				
Pause time	T40 =000.000s	Mold position	S640	=	075.
Mold closing pressures					
Closing pressure	P682 =085%				
Pressure Build-up	P681 =020%	T681 = 000.10s			
	C608 = 0	Switched off			

02.01 Summary of mold auxiliary controls/robotics

Enable removal	T680 = 0065.0				
Delays					
Blow off sprue	T602 = 000.03	Sprue blowing time	T603	=	000.1
Advance ejector pin	T53 = 000.10s				
Transfer stroke forward	T55 = 000.12s				
Transfer Stroke return	T56 = 000.15s	Extend removal	T668	=	000.2
Embosser forward	T62 = 001.20s	Embosser return	T63	=	000.1
Blow on nozzle side	T75 = 000.50s	Nozzle side blowing time	T74	=	000.8
Blow on moving side	T671 = 000.00	Moving side blowing time	T71	=	000.1
Unit Forward	T680 = 000.70s				
Starting program	C683 = 00000	T683 = 000.00s	S683	=	0004.
Cyle time	T11 = 009.05s				
Removal time	T640 = 000.70s				

FIG. 41C

03.01 Metering							
Screw retraction	C17 = 0		Switched off				
Metering Delay	T20 = 000.50 s		Metering time	T21 = 005.9			
Metering stages	C124 = 2						
	S23 = 026.0 mm		P23 = 0060 bar		N23 = 100 1.		
Metering end point	S24 = 029.0 mm		P24 = 0010 bar		N24 = 020 1.		
Holding pressure	P27 = 0010 bar		Start of injection		S0 = 029.0		

04.01 Injection							
Enable injection	S682 = 0002.0 mm		Screw position	S641 = 029.0			
Injection values	C121 = 10		Start of injection	S0 = 029.0			
	V196 = 0050 mm/s		S196 = 030.0 mm				
	V197 = 0062 mm/s		S197 = 027.6 mm				
	V198 = 0085 mm/s		S198 = 025.6 mm				
	V199 = 0115 mm/s		S199 = 024.0 mm				
	V200 = 0120 mm/s		S200 = 019.8 mm				
	V201 = 0110 mm/s		S201 = 016.2 mm				
	V202 = 0085 mm/s		S202 = 009.5 mm				
	V203 = 0065 mm/s		S203 = 008.0 mm				
Enable V/P changeover	V204 = 0040 mm/s		S204 = 004.0 mm				
Forcible changeover	V205 = 0025 mm/s		S205 = 001.5 mm	T2 = 000.3			
			V/P changeover point	S11 = 004.0			
Flow number	S121 = 018.2 mm		S122 = 015.0 mm	C125 = 2776			
Pressure monitoring			Peak pressure	P125 = 01044			
First stage	P101 = 01300 bar		T201 = 00.02 s				
Second stage	P102 = 01100 bar		T201 = 00.02 s	S102 = 006.0			

FIG. 41D

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04.02 Holding pressure, cooling									
Holding pressure values	C122	=	04	Changeover point			S11	=	004.0
	P12	=	00550 bar						
	P117	=	00420 bar	T117	=	000.20			
	P118	=	00380 bar	T118	=	000.40			
	P119	=	00200 bar	T119	=	000.90			
Holding pressure time				T120	=	002.00			
Cooling time	T39	=	005.30 s						
Melt cushion monitoring				Melt cushion			S19	=	003.7
Upper limit	S219	=	010.0 MM	Lower limit			S119	=	000.5

05.01 Nozzles, unit, purging/dry cycles									
Standstill monitoring	C606	=	60 min	C640	=	0004 min			
Unit									
Unit forward	T680	=	000.70 s	V29	=	030 %			
Lift	T30	=	000.30 s	V30	=	050 %			
Unit set-up and manual movements									
Move forward	V816	=	030 %	Lift	V806	= 030 %			
Purge/dry cycle/clean									
Number of metering strokes	C16	=	20	C201	=	50			
Metering	S16	=	028.0 mm	P16	=	0060 bar	N16	=	200
Injection	S18	=	001.5 mm	V101	=	05 mm/s			
Delay for purging	T606	=	000.00 s						

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FIG. 41E

06.01 Temperature control, plastifier zones/temperature control devices

Zone/description	Set point	Actual value	Reduced	Tolerance minus	Tolerance plus	Heating outputs	Cooling
10 Melt temperature	310° C	305° C	180° C	040° C	040° C		
30 Nozzle	330° C	330° C	180° C		040° C	014%	
13 Nozzle	315° C	315° C	180° C	040° C	040° C	025%	
Cylinder head	310° C	310° C	180° C	040° C	040° C	008%	
15 Compression	305° C	305° C	180° C	040° C	040° C	005%	
16 Compression	305° C	308° C	180° C	040° C	040° C	006%	
18 Feed	300° C	295° C	180° C	040° C	040° C	070%	
20 Inlet	060° C	060° C	060° C	040° C	040° C		024

Zone/description	Set point	Actual value	Reduced	Tolerance minus	Tolerance plus	Heating outputs	Cooling
24 Heating/cooling device	112° C	093° C	050° C	020° C	020° C	000%	000
25 Heating/cooling device	114° C	091° C	050° C	040° C	020° C	000%	000

08.01 Disk transfer

Peripherol interface	C684	=	0	Without signal acknowledgement			
Buffer switch-off size	C680	=	65000				
Production delay	T682	=	001.00 s	C605	=	0	With interruption of cycle
Max. transfer time	T601	=	001.00 s				

FIG. 41F

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09.01 Production control

Application	C340 = 2	No application			
Data set number	C315 = 100				
Production sequence					
		Piece counter	C324 =	29270	
Item number	C303 = 1	Cycle counter	C325 =	29270	
Cycle time	T11 = 009.05 s	Failure rate	C718 =	30.56%	
Production preperation		Reason	C357 =	00	

10.01 Process statistics

Q monitoring	C340 = 2	Monitoring without screenning out			
Q report	C700 = 0	No report			
	cycles of which	out of tolerance	failure rate		
Total	C325 = 29270	C318 = 8946	C718 = 30.56%		
Random sample	C326 = 29269	C338 = 8946	C738 = 30.56%		

Process variables	Set Point x	Tolerance +/-	Actual Value x	Mean xq	Scatter 3s	Out of Tolerance
Metering time	1.20	0.30	5.98 s	2.32	5.408	-06786
Injection start	30.1	2.0	29.0 mm	28.6	0.82	2028
Injection time	0.47	0.20	0.33s	0.39	0.105	0
V/P changeover point	3.5	1.0	4.0 mm	4.0	0.04	0
Melt cushion	4.2	1.0	3.7 mm	3.8	0.25	0
? peak value	600	200	871 bar	682	99.9	-06566
? peak value	0		0 bar	0	0.0	
Flow number	2500	300	2776	2441	99.9	359
Cycle time	3.90	0.50	9.05 s	5.08	6.421	-06570

FIG. 41G

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10.02 Configuration of the quality monitoring

Reaction: Process data outside tolerance
Switch-off behavior C703=0 no reaction

10.03 Q report intermediate store

Manufacturer
Machine No. DVD_F50
Job data

FIG. 41H

16.01 System characteristics

Machine data

Machine type	DISCJET 600/110	Order number	DVD_F50
Control version	PAC 13.54	IMC 12.26	CEL 10.31
Database version	DB 05.80	Date created	23.10.1996
Special	350400	Version	17106

Mold data
Installed height S90 = 160 mm

Plasticizing	Identification	C806 =	024		C804 = 0024
Ram nominal diameter	S801 =	032.0 mm		Max metering stroke	S802 = 100.0
Max. permissible melt pressure	P800=01482 bar			Max. specific melt pressure	P802 = 01482 bar
Max. permissible backpressure	P801 =	0317 bar			

Temperatures	Set point/actual value	Tolerance −/+		Heating	Cooling
Cabinet	TH1 = 035 026° C	030° C	010° C		
Oil	TH2 = 050 051° C	041° C	011° C	000%	005

FIG. 41I

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